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American Gas Journal

THE MAGAZINE OF GAS DISTRIBUTION

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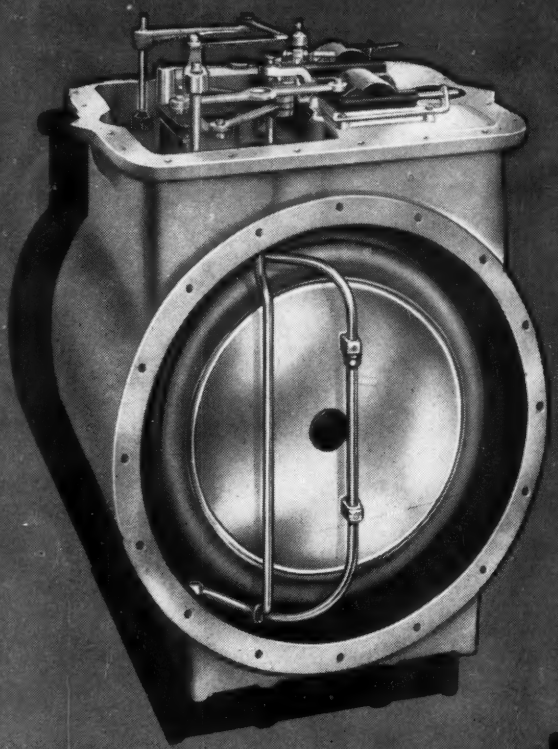
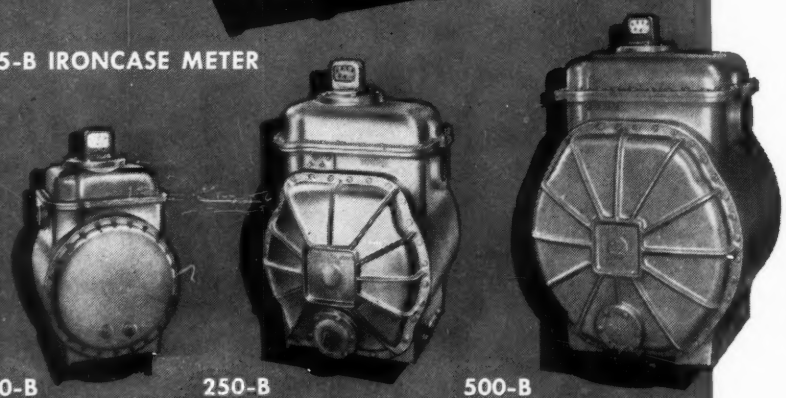


35-B IRONCASE METER



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Volume 186 November 1959 Number 12

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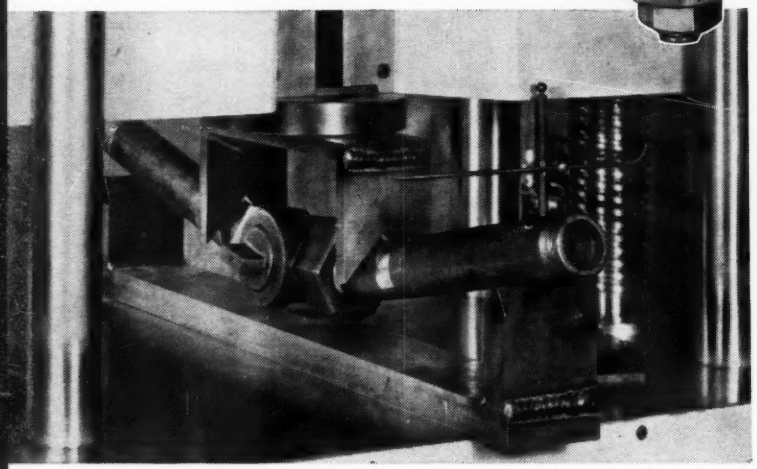
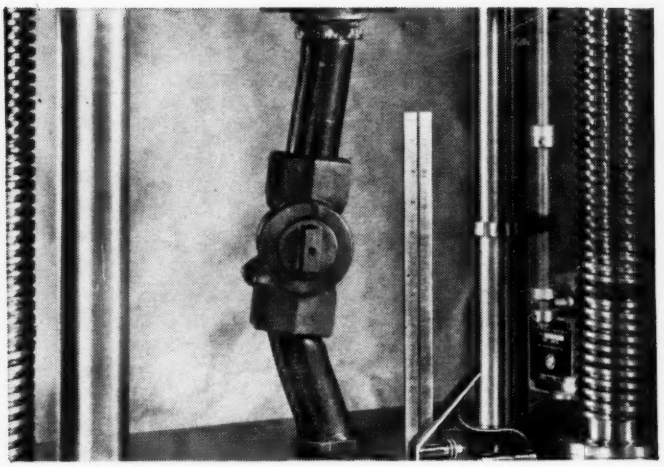
Special Report from MUELLER CO.

Rugged tests prove durability of new MUELLER® *500 pound LubOseal Stop made of Ductile Iron*



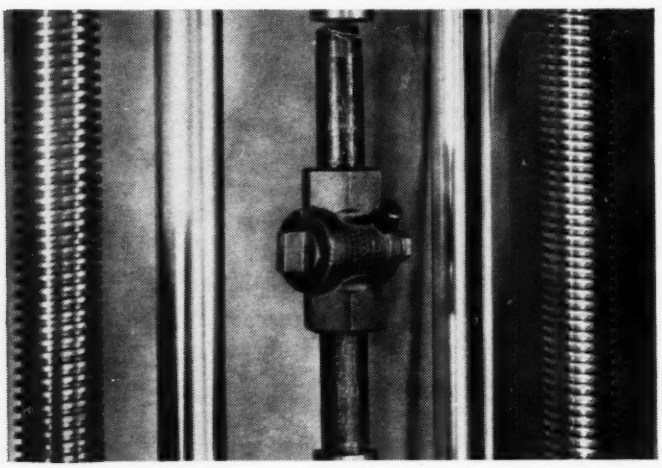
1. BENDING TEST

Schedule 80 Steel Pipe. Bending load of 4,000 pounds applied. Bending moment — 18,000 inch pounds.
Results: Pipe badly distorted. Stop position bent 2.83 inches out of line. Stop intact. Retested at 500 p.s.i. air pressure under water in closed position. *No leaks at top or bottom of key or through port.*



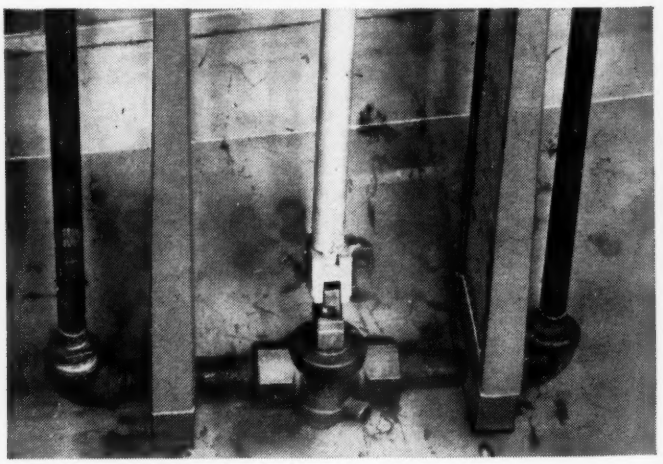
2. COMPRESSION TEST

Schedule 40 Steel Pipe. Compression load of 26,200 pounds applied.
Results: Pipe badly distorted. Pipe threads stripped. Stop position bent 1.30 inches out of line. Stop retested to 500 p.s.i. air pressure under water. *Absolutely tight in closed position with no leaks at top or bottom of key.*



5. TENSILE TEST

Schedule 40 Steel Pipe. Tensile pull of 22,150 pounds applied.
Results: Pipe stretched to breaking point in threaded section. Stop retested with 500 p.s.i. air pressure under water. *Absolutely tight in closed position with no leaks at top or bottom of key.*



6. CYCLING TEST

Stop fully opened and fully closed for 6,500 cycles while submerged in water and under air pressure of 350 p.s.i.
Results: Stop did not leak during operation. Stop re-greased and retested with 500 p.s.i. air pressure under water. *No leaks at top or bottom of key or through port with stop closed.*

To meet the need for a high pressure meter stop, Mueller Co. has developed a new LubOseal Stop with body and key cast from ductile iron. Ductile iron was selected because of the need for a stop with higher impact and fatigue resistance and the strength of steel.

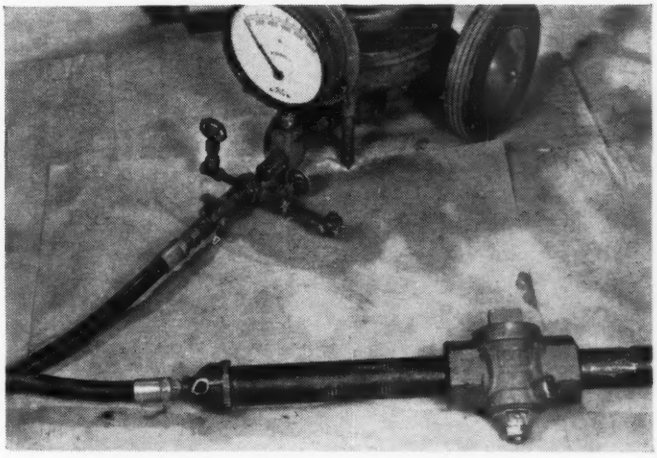
Mueller Engineers have subjected this new stop to the severest of tests in Mueller's Product Testing and Development Laboratory. Several of these tests are shown here.

System piping stresses were simulated by exhaustive compression, tension, torsion and bending tests. Cycling tests were used to determine the service life of the stop. Relubrication tests determined the functionality and durability of the greasing system.

Pressures, far in excess of those encountered in a high pressure system, were imposed on the stop to verify the degree of safety incorporated in the stop design.

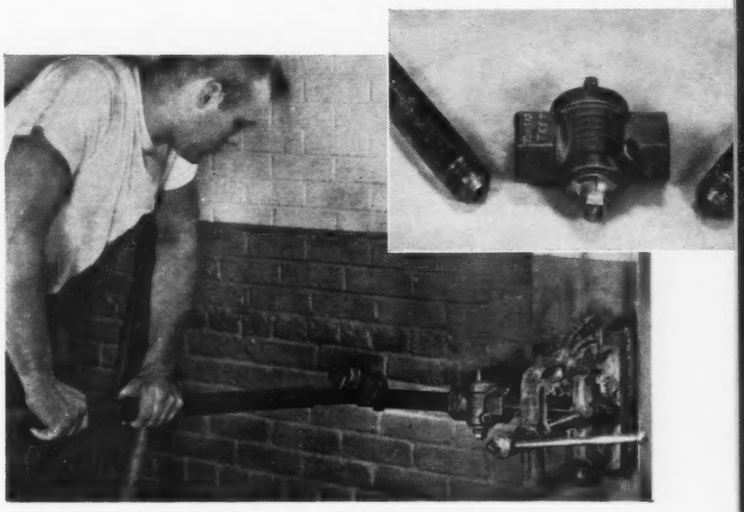
The results of this extensive test program have proven the ability of the new Mueller 500 pound, Ductile Iron LubOseal Meter Stop to perform successfully under even the most adverse operating conditions at its rated pressure of 500 p.s.i.

If you would like full information and specifications on these new stops, write today to: Mueller Co., 512 West Cerro Gordo Street, Decatur, Illinois.



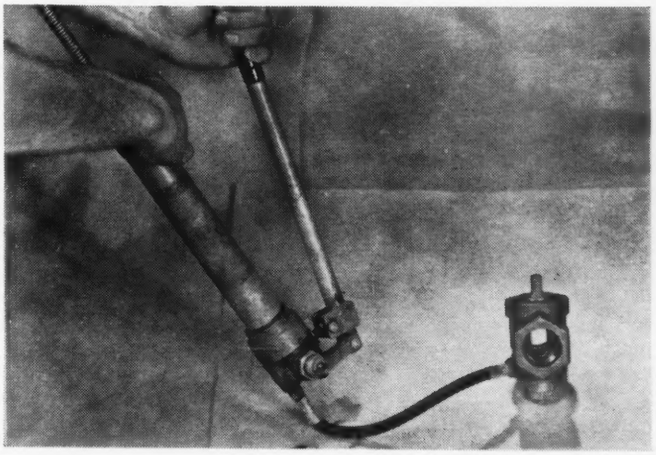
3. HIGH PRESSURE DESTRUCTION TEST

Stop in closed piping system. Extreme pressure applied.
Results: Reducing coupling broke at 9,500 p.s.i. Stop did not leak. Stop retested with 500 p.s.i. air pressure under water in closed position. *No leaks at top or bottom of key and negligible port leakage. Stop shows high safety factor.*



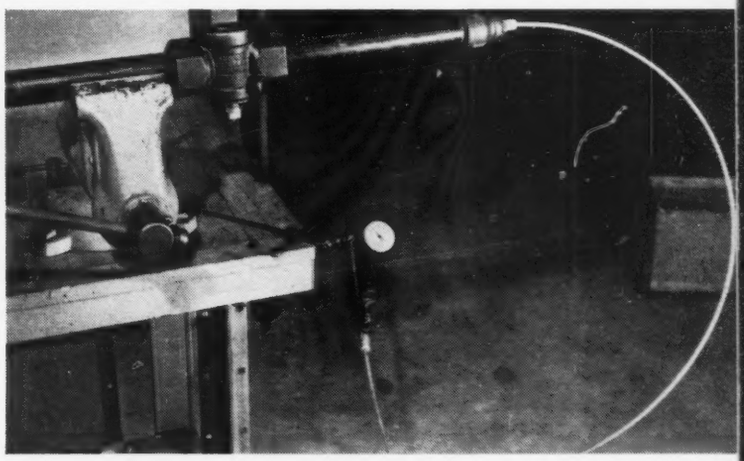
4. TORSION TEST

Schedule 40 Steel Pipe. Pipe securely fastened in pipe vise. Torque applied to pipe on opposite side of stop.
Results: Extensive tightening caused pipe to fail with no damage to stop. Stop retested with 500 p.s.i. air pressure under water. *Absolutely tight in closed position with no leaks at top or bottom of key.*



7. REGREASING STOP IN OPEN POSITION

Excessive grease pressure applied.
Results: *No grease entered port.*



8. REGREASING STOP IN LINE

Grease plug removed and stop regreased at rated line pressure of 500 p.s.i.
Results: *No loss of grease through relubrication port due to high line pressure.*

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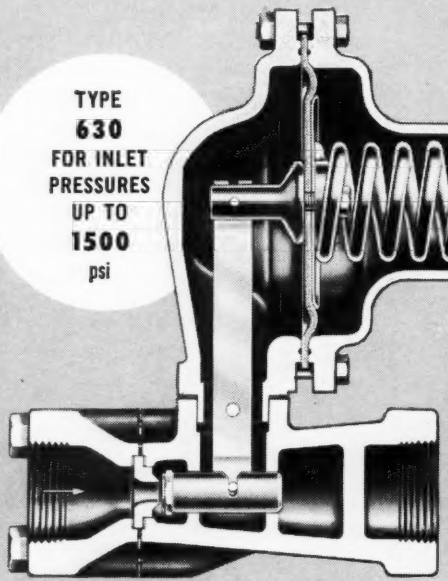
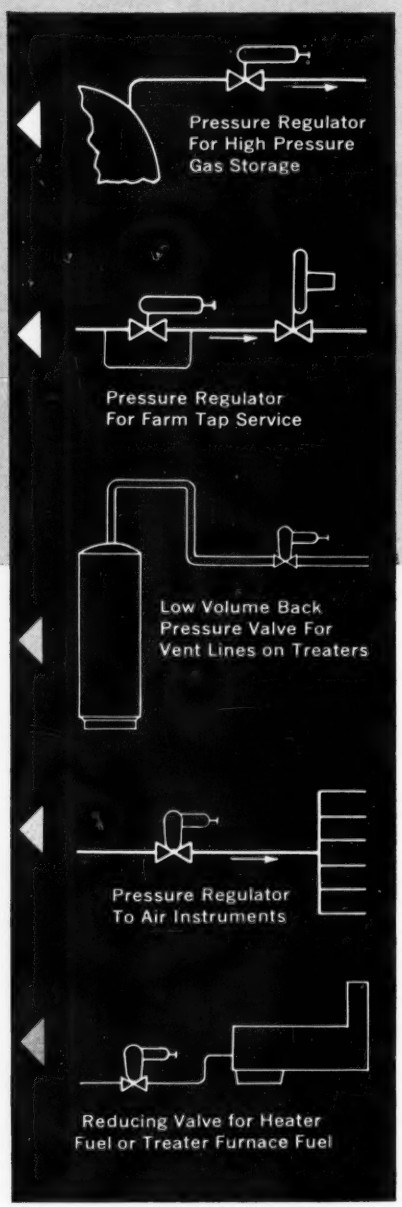


BIG JOE Type 630. Reduces high pressure gas to a constant supply pressure of 5 to 200 psi. Valve disc material: Up to 200 psi inlet BunaN is furnished. 200 psi inlet and above, Nylon is furnished. (Teflon is available when specified.)

Big Joe is supplied in 1″ or 2″ screwed connections. Type 630 can also be furnished as a relief valve, Type 630R for relief pressures up to 175 psi.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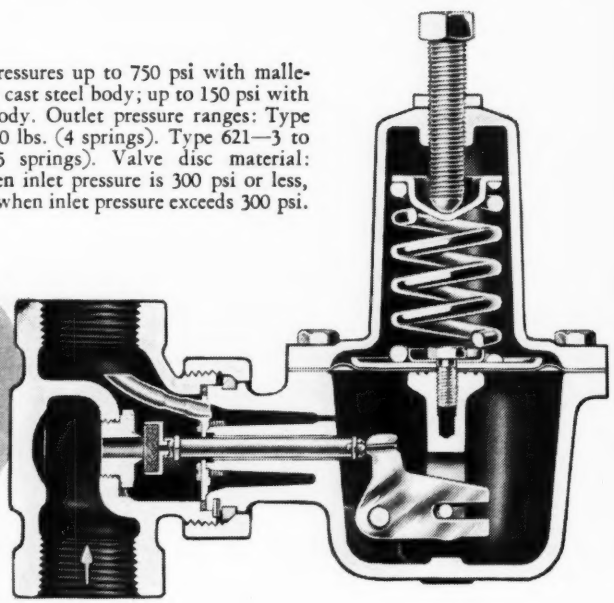
Reducing Valve for Heater Fuel or Treater Furnace Fuel

For inlet pressures up to 750 psi with malleable iron or cast steel body; up to 150 psi with cast iron body. Outlet pressure ranges: Type 620—3 to 60 lbs. (4 springs). Type 621—3 to 100 lbs. (5 springs). Valve disc material: BunaN when inlet pressure is 300 psi or less, and Nylon when inlet pressure exceeds 300 psi.

TYPE **620** FOR INLET PRESSURES UP TO **750** psi



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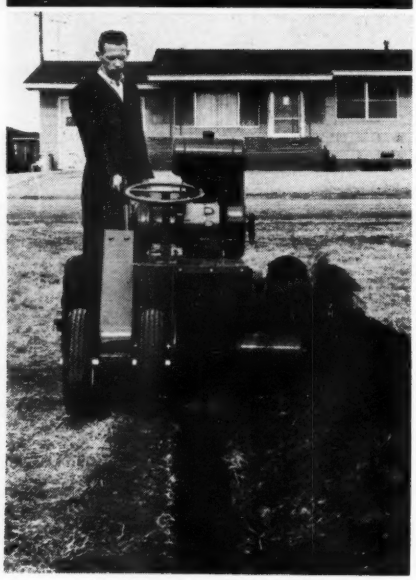

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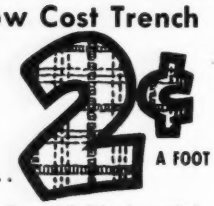

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M C F

NEWS HILITES OF THE INDUSTRY

Independent producers can't abandon natural gas sales without authorization, an FPC examiner has ruled. A group of independent producers must resume making natural gas sales, which they abandoned in 1957, to United Gas Pipe Line Company, says Examiner F. L. Hall. He declared that the producers should not have abandoned the sale without prior FPC authorization. The sale to United was made from leases in Refugio County, Texas, by P. R. Rutherford, et al. The Rutherford group filed application with the FPC in August, 1956, seeking authorization for abandonment; sale actually was discontinued in 1957, before the FPC had taken any action. The gas is now being sold in intrastate commerce to Industrial Gas Supply Corporation.

Examiner Hall opined that the Natural Gas Act provides for exclusive FPC control over abandonments and prohibits any "natural gas company" from stopping deliveries without express FPC authorization. *(The Supreme Court has declared independent producers to be "natural gas companies" even though the 1938 Act did not.)* The producers said that United does not need the gas while it is vitally needed by Industrial to continue service to existing customers. The examiner said that — although United did not appear at the hearing — there was nothing in the record to show the company's lack of need for the gas. He also said that statements by counsel for the producers and Industrial to that effect do not constitute evidence. He also declared that for the producers to urge that abandonment would not have an important impact upon United "is to argue that impropriety is all right so long as it is not great." To approve this kind of action would only serve as a bad precedent that could be raised by future applicants, he noted. *Gas sold to United for 4.7 cents per Mcf at the time sale was abandoned is now sold to Industrial for 8.5 cents per Mcf.*

An appeal to set aside a state district court decision that held Colorado Interstate Gas Company direct sales rates cannot be regulated by the state is under consideration by the Colorado Supreme Court. The appeal was lodged by Colorado Public Utilities Commission and three of CIG's biggest customers — City of Colorado Springs, Public Service Company of Colorado, and Colorado Fuel & Iron Corporation. Direct sales involved are those for power generation by Public Service Co., municipal power plants, and large industries. The State supreme court was asked to hold the entire matter in *status quo* until the court can make a final decision. This would prevent CIG from raising its rates on direct sales until the final outcome.

Gas firm franchise deferred in Miami, Florida, by "civic groups." City officials in Miami have held up a franchise for the Houston Corporation pending a ruling by the state on charges that the firm charges small consumers too much for natural gas. The delay was urged by Miami Junior Chamber of Commerce, which is challenging rates charged by Houston to some 16,000 Miami customers. Earlier, the Jaycee group petitioned Florida State Railroad and Public Utilities Commission for a hearing on the gas firm's rates and rate policies. Sanford Freed, Jaycee counsel, said the group chiefly is concerned about the increase in gas rates to minimum consumers. He said, under the old Florida Gas Company operation, minimum rate was $1.10, but this rose to $2 when Houston took over. *(The Jaycee group made no mention of the increased Btu content of the natural gas to be served by Houston Corporation in place of the lower Btu value manufactured gas.)* The new rate was approved by the utilities commission, but without a public hearing.

Church Strikes Natural Gas on its Property Again. Catholic Church in Orchard, New York, struck natural gas on its property for the second time in two years. The Rev. Edward F. Ott, of The Nativity of Our Lord Church said gas from the second 1600-ft well would heat a new school on the church grounds. The first well provides fuel for the church building, the rectory and convent. Natural gas wells had been operated on present church site 45 years ago, but had been closed down because they did not produce enough for commercial use.

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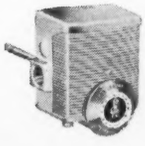

UNITROL 110R (with built-in pressure regulators)

UNITROL 400

UNITROL 200

UNITROL 110

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permanent molded-on design simplifies assembly

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Ask your American representative for Bulletin 308 describing all insulated and standard meter connections.

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MEN AT WORK

IN THE GAS DISTRIBUTION INDUSTRY

R. E. DuVall

R. E. Seymour

● **Richard E. DuVall** and **Robert E. Seymour** have been elected vice presidents of The Peoples Natural Gas Company. DuVall, formerly general superintendent of the utility, is now vice president — operations; Seymour, previously assistant to the president, is now vice president — administrative.

● **James D. Perley** has been appointed director of employee relations for the Consolidated Natural Gas Company. He was formerly assistant vice president of personnel with Westinghouse Air Brake Company.

J. D. Perley

M. J. McCullough

● **Martin J. "Marty" McCullough** has been appointed assistant manager of industrial relations for Northern Indiana Public Service Company in addition to his present duties as head of employment and employee welfare.

● Three additional members have been appointed to the staff of Houston Natural Gas System's technical services department. They are: **Paul H. Dixon Jr.,** industrial sales engineer; **Wayne M. Lippert,** air conditioning engineer; and **Glenn O. Koym,** agricultural sales representative.

● **C. Church More** has joined Adams Pipe Repair Products of South El Monte, California. In addition to general administrative work, More will direct an expanded advertising and sales promotion program on Adams pipe repair clamps.

● **William T. McLaughlin** has been promoted to field sales manager for the Protective Coatings Division of Pittsburgh Coke & Chemical Company. He will be responsible for supervision of the division's nationwide sales including sales of pipe coatings to the gas distribution and transmission industries and a wide range of corrosion-resistant coatings for industrial use.

● **Ralph J. Davidson** has been appointed district sales manager for the Pacific Southwest by Grayson Controls Division, Robertshaw-Fulton Controls Company.

● **Betty Whitlock** has been named creative director of DMCO, Dallas-based firm recently organized by Donald M. Mayne. She will direct creating and producing of film strips, animated films, slides, narrations and visual training programs. She was formerly advertising supervisor for Southern Union Gas Company.

● **L. L. Armstrong,** vice president in charge of operations of Commonwealth Natural Gas Corporation, has retired under the age provisions of the company's retirement plan, but will continue to serve the corporation as a consultant. **Harvey S. German,** superintendent of maintenance and construction, and **Paul H. Riley,** superintendent of measurement and dispatching, will assume his duties.

● **Daniel J. Crowley** has been named to the newly-created position of manager for Southern Union Gas Company's Austin district. He will be in charge of operations in Austin including providing natural gas service to almost 50,000 customers and supervising the 260 persons employed by Southern Union in the Austin district.

● **Richard S. Maxwell,** Columbus district credit manager for Ohio Fuel Gas Company, has been promoted to district supervisor of customer accounting. **Fred Fowler,** district plant manager at Zanesville retired October 1, after 36 years of service with O-F.

● **Harold R. Sneddon,** East Liverpool plant and service foreman for Ohio Valley Gas Company, has been promoted to East Liverpool division manager succeeding **W. T. McIntyre,** who has retired.

● **Forrest G. Hammaker, Jr.** has been appointed chief methods engineer at the A.G.A. Laboratories succeeding **Howard Scott,** who resigned to join the staff of Consolidated Natural Gas Company. Since 1957 Hammaker has actively supervised the Labs research projects on domestic gas cooking and comparison of competitive services.

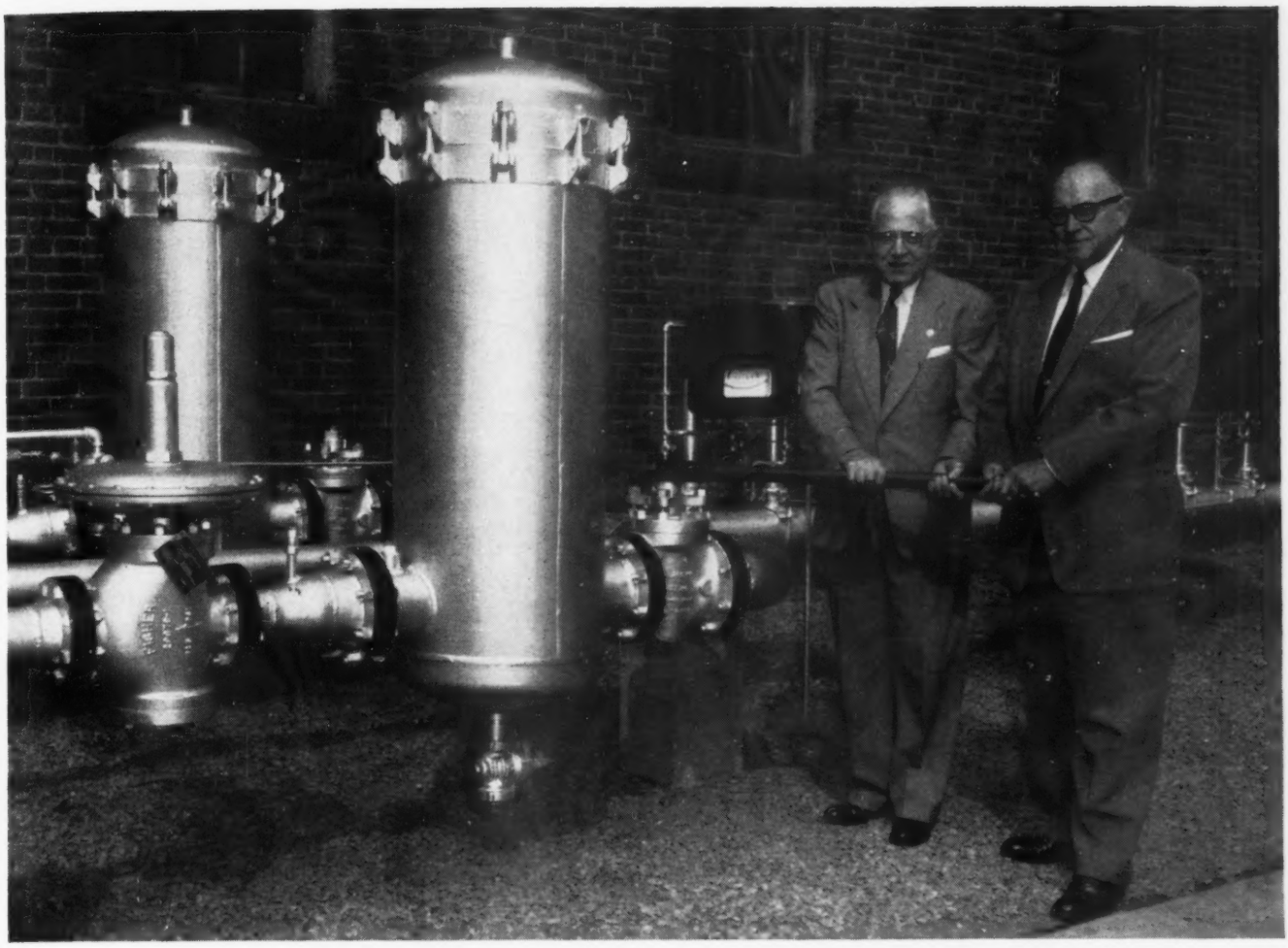
● **Robert B. Batten** has been appointed assistant chief engineer of Michigan Consolidated Gas Company. He was formerly an assistant to the chief engineer.

R. B. Batten

J. M. Colby

● **Brig. Gen. Joseph M. Colby,** deputy commanding general, U. S. Army Ordnance Missile Command at Redstone Arsenal, Alabama, has been named vice president of engineering for Rockwell Manufacturing Company. **C. A. Wiken,** vice president of research and engineering, now becomes vice president of the research and development department which will devote its energy toward creating new products to augment existing lines. Gen. Colby, as vice president of engineering, will direct his department's activities. **Walter G. George** has been appointed manager of Rockwell's export department. He will be responsible for negotiations involved in sales of all Rockwell products exported to agents and customers throughout the world.

● **A. W. Peabody** has been appointed supervising engineer of the corrosion engineering group of Ebasco Services Incorporated.



Charles H. Gueffroy, left, president of Portland Gas & Coke Co., and Carl E. Braun, vice-president and manager of Publishers Paper Co., Oregon City, Ore., "turn on the gas" at latter's plant. In foreground are two 6-inch Staynew filters, Model CPHG-10030, part of a large purchase by Portland utility.

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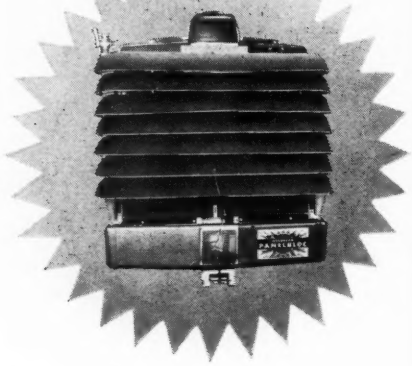

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Men at Work

● **Earl B. Cutter, Jr.,** formerly assistant to the vice president, sales, has been appointed southern district manager of American Meter Company's southwest division. He will make his headquarters in Dallas, Texas.

E. B. Cutter

H. P. Boncher

● **Hector P. Boncher** has been appointed to the newly-created position of vice president-marketing of Dresser Industries, Inc. He was formerly operating vice president of Dresser, and prior to that, general manager of Dresser Manufacturing Division at Bradford, Pennsylvania.

● **Warren G. Parmenter** has been appointed manager of Walworth Company's plastics section. He will be responsible for all development and related activities pertaining to plastic valves and fittings.

● **Newton Zahniser** has been named sales manager of Superior Meter Company, subsidiary of the Gas Meter Division of Neptune Meter Company.

● **Warren E. Mickelson** has assumed the duties of **George G. Holmes** who has retired as division gas plant manager at Central Electric & Gas Company after more than 40 years in the gas industry. **Wayne E. Beams,** assistant division utilization engineer, succeeds Mickelson as director of training and safety.

● **H. Greville Smith** of Montreal has been elected a director of Quebec Natural Gas Corporation.

H. J. Thomas

J. I. Michaels

● Massey-Ferguson Industrial Division has announced the appointment of **Henry J. Thomas** as chief engineer. He has had wide experience in earth-moving and construction equipment design. **J. I. Michaels** has been named consulting engineer to assist the chief engineer in supervision of engineering activities and will specialize in technical aspects of design and specifications of materials and parts.

Edward J. O'Neill, 64, assistant secretary of Consolidated Edison Company, died suddenly August 22 at his home at 4064 Bronx Boulevard. He had served with the utility for almost 45 years.

J. I. (Jack) Trimble, 54, vice president and general manager of the Janitrol Heating and Air Conditioning Division, Surface Combustion Corporation, died suddenly September 9 in Columbus, Ohio.

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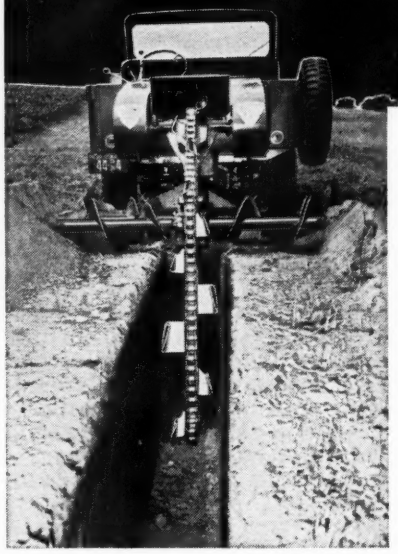

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Men at Work

C. L. Daniels

D. H. Mitchell

● **Conrad L. Daniels** has been appointed works manager of the Rockford, Illinois, plant of J. I. Case Company. **Lawrence H. Hodges,** former works manager, has been promoted to a top position in central engineering at the company's headquarters in Racine, Wisconsin. **Donald H. Mitchell** recently joined the company as manager of the newly-formed industrial products division. He was formerly eastern sales manager for LeTourneau-Westinghouse.

● **Kathleen G. Skinner** and **Joseph S. Long** have been elected assistant secretary and assistant treasurer respectively for Northwest Natural Gas Company, succeeding the late Noble H. Stephens who formerly filled both positions. Skinner has been administrative assistant to **Charles H. Gueffroy,** president, and will retain that role; Long will continue also as assistant controller.

● **Clarence E. Baker,** former eastern regional sales manager for Arkla Air Conditioning Corp., has been appointed coordinator of sales for Reynolds Gas Regulator Co., Inc. Both Arkla and Reynolds are subsidiaries of Arkansas Louisiana Gas Co.

● **Wey Kenny** has been appointed general accounting manager for Massey-Ferguson industrial division. He was formerly regional internal auditor for Vulcan Materials Company of Birmingham.

● **Frank P. Kelly** has been appointed manager of manufacturing operations for the Philadelphia-based Brown Instruments division of Minneapolis-Honeywell Regulator Company, succeeding **Frank M. Rea,** who has been assigned to Honeywell's industrial products group as a consultant in industrial engineering, tooling, and subcontracting. Kelly was formerly general superintendent.

● **Robert F. Snowden** has been named sales representative for Walworth Company in the company's Gulf division.

● **David D. Hunsaker** has been appointed manager, sales development, for The Frank G. Hough Company of Libertyville, Illinois. He will be responsible for sales engineering, training aids, product knowledge, and merchandising programs.

D. D. Hunsaker

W. Ditmanson

● **Willis Ditmanson** has been named national parts and service manager for Motorola Communications & Electronics, Inc., wholly owned sales and service subsidiary of Motorola, Inc.

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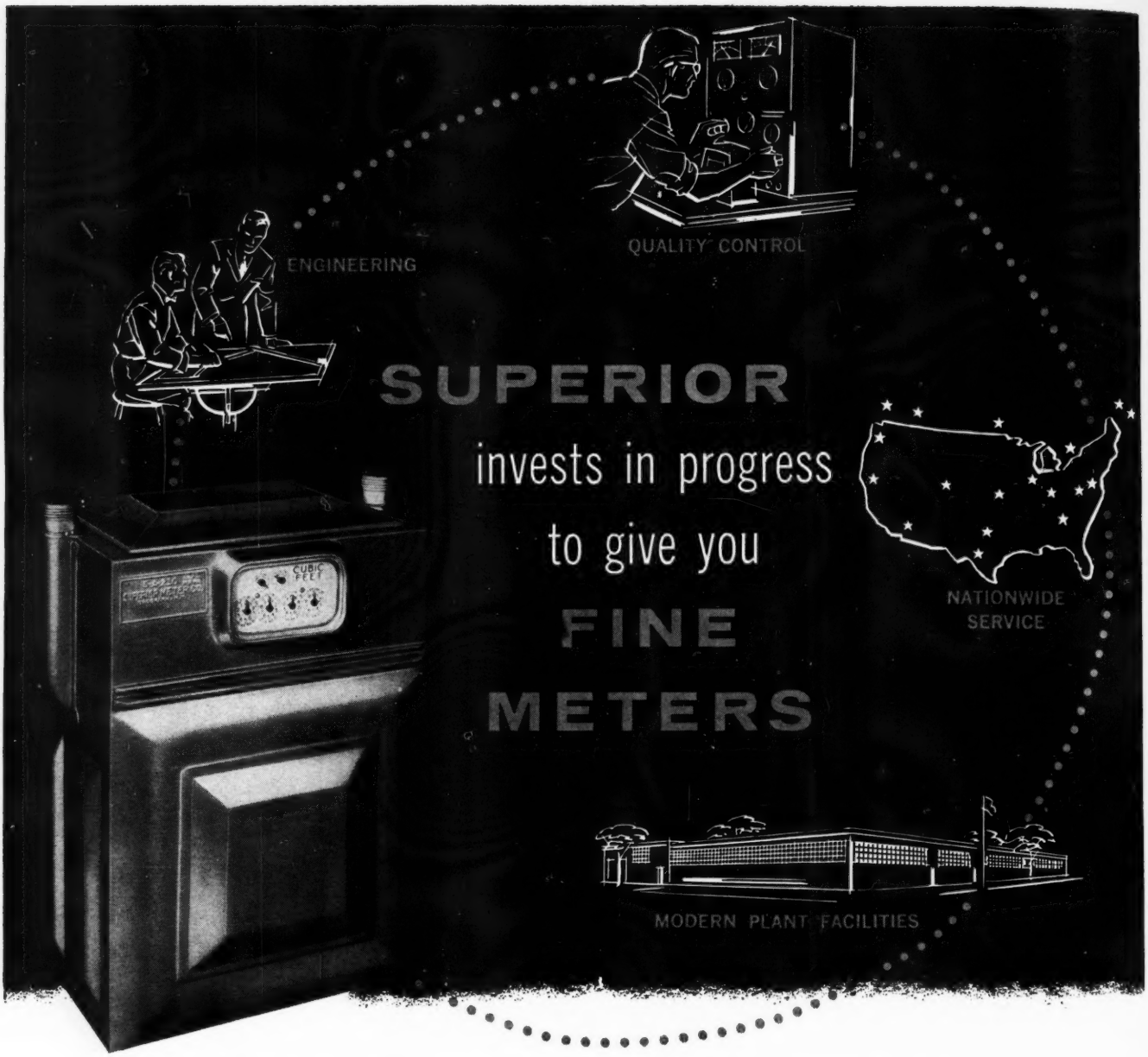

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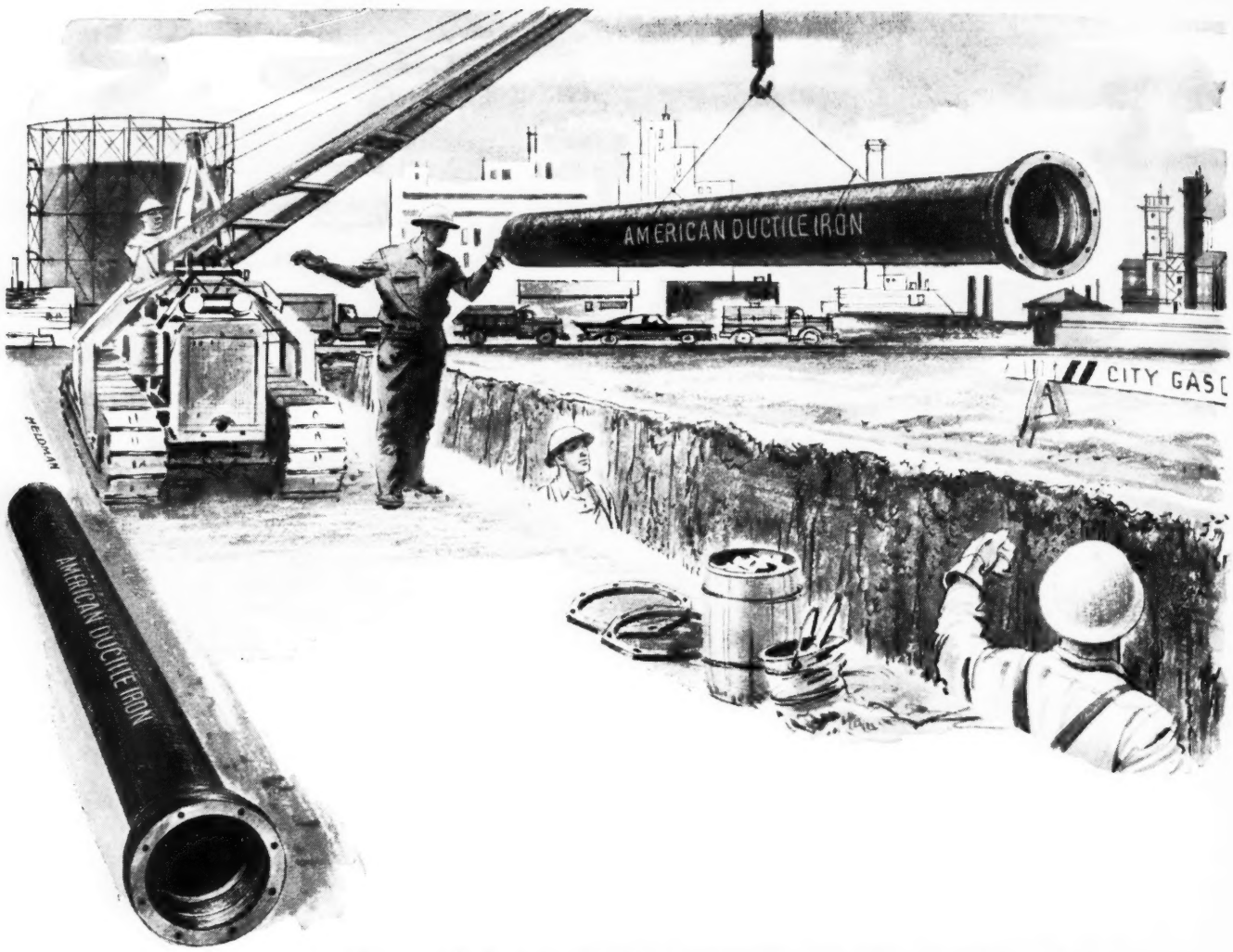

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PEAK SHAVING VS WINTER NATURAL GAS SERVICE

A method for determining the most economical combination

Dean B. Seifried, *Orange and Rockland Utilities, Inc., Nyack, New York*

GENERAL ACCEPTANCE OF GAS as a space heating fuel imposes a burden upon the utility company in having to supply widely varying daily loads — ranging from a pure base load in summer to a peak day load in severe winter weather, which may be as much as 10 times the base load.

Firm natural gas service is generally sold on a contract-demand basis, the "two-part" rate involving a monthly demand charge based upon the maximum daily quantity specified in the contract, and a commodity charge based upon the actual volume purchased monthly. If the contract demand were to be established at an amount sufficient to satisfy the load requirements on the design peak day, the average cost of the last increments of demand, used on one or more of the days of highest load, would be very high because the incremental annual demand charge would be spread over so few Mcf.

It is, therefore, economically desirable to limit the contract demand and to provide sufficient daily capacity from other sources to meet the design peak requirements. Such sources may be manufactured gas, including LPG-air; storage in any of its several forms; special winter service agreements that are offered by some pipeline companies on a firm basis, or combinations of any of these. There is usually a particular combination of supplies that will result in a lower annual cost than any other combination.

Forms of Pipeline Service

There are probably many forms of winter service, but generally, they can be classed in three categories:

1. Winter Service. This type (as exemplified by Algonquin Gas Transmission Company's WS-1 rate) involves a firm maximum daily quantity and an associated winter quantity which is normally a specified multiple of the daily quantity. The winter quantity is normally on a "take-or-pay-for" basis and may be in the order of 50 to 100 times the daily quantity. In some instances, the firm daily quantity may be augmented by an interruptible quantity at the seller's option.

2. Storage Service. (For example, Tennessee Gas Transmission Company's rate SS-5.) In this case, no additional annual quantity is purchased on the firm contract. Within limitations set by a storage service contract, the supplier withholds gas during off-peak periods, placing this in his storage. It is then available to the purchaser in peak periods in daily volumes not exceeding contract specifications. The cost of service is generally in the form of a demand charge based upon the contractual maximum daily quantity withdrawn from storage. This type service is especially adapted where supplier has a minimum "take-or-pay-for" clause in the contract-demand rate, and purchaser does not have sufficient summer base load (including interruptible markets) to absorb the minimum quantity.

3. Authorized Over-Run Service. (For example Home Gas Company's AOS-1.) This form is generally available within the framework of the contract for firm contract demand gas. It is offered only when the supplier's facilities and sources are adequate, and is entirely interruptible. It is usually lower in price than other winter services, often being the 100 percent load factor cost. This service can provide very substantial windfall savings in reducing peak shaving production costs but cannot be considered in providing firm capacity for design peaks.

Importance of Weather Records in Economic Studies

The annual average unit cost of contract demand gas, including the demand charge, depends upon how much gas is purchased annually. Each additional increment of demand purchased is usable on successively fewer days so that the cost of the gas purchased between uniform increments of

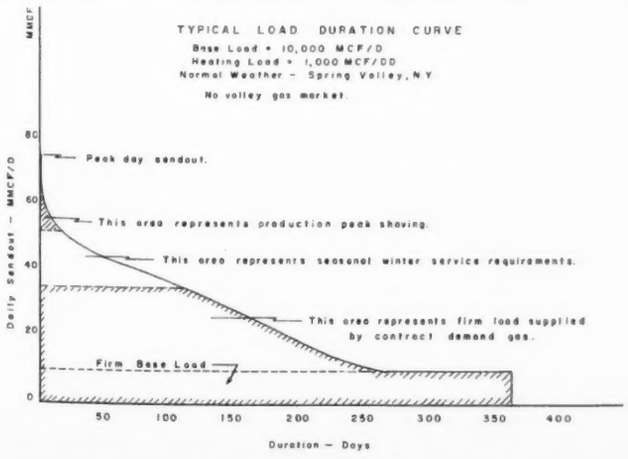


FIG. 1. Typical load duration curve, no valley gas market.

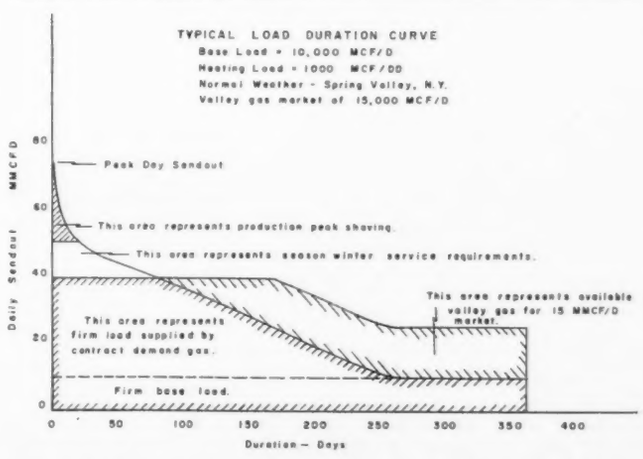


FIG. 2. Typical load duration curve, interruptible load on system.

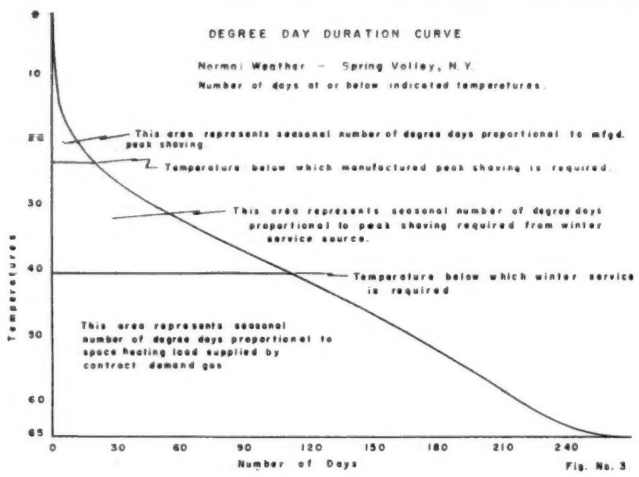

DEGREE DAY DURATION CURVE
Normal Weather - Spring Valley, N.Y.
Number of days at or below indicated temperatures.
This area represents seasonal number of degree days proportional to mfgd. peak shaving.
Temperature below which manufactured peak shaving is required.
This area represents seasonal number of degree days proportional to peak shaving required from winter service source.
Temperature below which winter service is required
This area represents seasonal number of degree days proportional to space heating load supplied by contract demand gas
Temperatures
Number of Days
Fig. No. 3

FIG. 3. Degree day duration curve.

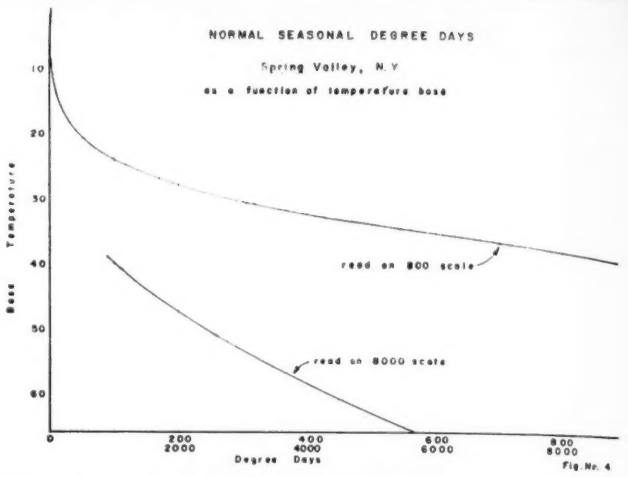


FIG. 4. Degree days plotted against temperature.

demand becomes more and more expensive.

While this is generally well known, it may not be so obvious that winter peaking service rates usually produce similar results. In the case of the winter service type rate, involving a contract winter quantity, only a part of the winter quantity will be useful in replacement of manufactured gas if the actual number of days use of demand is less than the ratio of the specified annual quantity to the maximum daily quantity. Storage service rates usually involve a demand charge and so may be treated somewhat similarly to contract demand rates. Even manufactured processes may be treated in economic studies as though there were demand and commodity elements of the cost. Fixed charges on investment plus fixed operating costs constitute the demand element, whereas production fuel, labor and production supplies constitute the commodity element. The relation of demand and commodity charges for each of these types of supplies (contract demand service, winter service, production) vary widely and so each is best adapted to a particular segment of the load.

In order to compute overall gas costs, it is necessary to know (directly or indirectly) the anticipated load for each day of the year. These loads sorted in descending order of magnitude, and plotted so as to provide a load duration curve, enable one to compute the seasonal volumes of gas required from various sources. Fig. 1, which shows a typical load duration curve, is based upon a hypothetical constant base load of 10,000 Mcf per day and a space heating load of 1000 Mcf per degree day.

It may be noted that a horizontal line drawn across the curve at a height representing contract demand, will divide the area enclosed by the curve into two parts, the lower area representing that part of the annual requirements which can be supplied by contract demand gas, and the upper area is that part representing the total of seasonal peaking gas. Fig. 2 is the same as Fig. 1 curve, but shows a graphical representation of an interruptible load. Both curves have been computed from the normal-weather degree-day duration curve shown in Fig. 3. This curve has been plotted from our own temperature records taken at Spring Valley, New York, and represents the average of about 25-year records. It is important, of course, to use weather statistics that are representative of the area served. (Although much of our gas system is within 20 miles of New York City, we are unable to use that city's weather bureau records and normals, because of a very substantial difference in temperatures, which probably result from New York City's proximity to the ocean and from a difference in elevation.)

The degree day curve in Fig. 3 may be divided similarly to Fig. 1, whereby the lower area represents the total of degree days that, when multiplied by the heating sendout per degree day, determines the amount of contract demand gas used seasonally to supply heating load. The upper area represents the degree days corresponding to seasonal peak shaving volumes. The horizontal dividing line is, of course, at the peak shaving temperature. In order not to have to planimeter this curve for the area, the seasonal degree days have been plotted against temperature in Fig. 4. Thus to determine the amount of peaking required in the season, it is necessary only to read the chart corresponding to the selected peaking temperature and multiply by the heating factor.

COMPUTATION OF TOTAL COST OF GAS PURCHASED AND PRODUCED NORMAL WEATHER

1.	Demand	32,000	32,000	32,000	32,000	32,000
2.	Winter Serv.	20,000	22,000	23,000	24,000	25,000
3.	T_1	43	43	43	43	43
4.	T_2	23	21	20	19	18
5.	D_1	1,465	1,465	1,465	1,465	1,465
6.	D_2	92	63	51	42	34
7.	FD_1	1,465,000	1,465,000	1,465,000	1,465,000	1,465,000
8.	FD_2	92,000	63,000	51,000	42,000	34,000
9.	$FD_1 - FD_2$	1,373,000	1,402,000	1,414,000	1,423,000	1,431,000
10.	Winter Quant.	1,200,000	1,320,000	1,380,000	1,440,000	1,500,000
11.	Deficiency	173,000	82,000	34,000	0	0
12.	Total Product.	265,000	145,000	85,000	42,000	34,000
13.	Natural Gas	7,879,000	7,879,000	7,879,000	7,862,000	7,810,000
	Costs:-					
14.	Demand	$1,536,000	$1,536,000	$1,536,000	$1,536,000	$1,536,000
15.	Commodity	2,757,650	2,757,650	2,757,650	2,751,700	2,733,500
16.	Total Firm	4,293,650	4,293,650	4,293,650	4,287,700	4,269,500
17.	Winter Serv.	1,200,000	1,320,000	1,380,000	1,440,000	1,500,000
18.	Manuf'd	530,000	290,000	170,000	84,000	68,000
19.	Total Cost	$6,023,650	$5,903,650	$5,843,650	$5,811,700	$5,837,500
	The Following Applies When There is a Market for Valley Gas					
20.	T_3	58	58	58	58	58
21.	D_3	4,074	4,074	4,074	4,074	4,074
22.	$D_3 - D_1$	2,609	2,609	2,609	2,609	2,609
23.	Excess Avail.	2,866	2,866	2,866	2,866	2,866
24.	Line 23 x F	2,866,000	2,866,000	2,866,000	2,866,000	2,866,000
25.	Credit @$0.10	$286,600	$286,600	$286,600	$286,600	$286,600
26.	Adjusted Cost	$5,737,050	$5,617,050	$5,557,050	$5,525,100	$5,550,900

FIG. 5. Sample computations of annual gas costs for various combinations of contract-demand, winter service demand, and peak shaving.

SUMMARY OF COMPUTED COST OF PURCHASING AND PRODUCING GAS FOR VARIOUS COMBINATIONS OF CONTRACT DEMAND AND WINTER SERVICE QUANTITIES

Contract Demand Mcf.	Winter Service Daily Quantity Mcf.	Total Cost of Purchase and Product. No Valley Gas Sales	Total Cost of Purchase and Product. with Credit for Valley Gas Sales
32,000	18,000	$6,143,650	$5,857,050
	20,000	6,023,650	5,737,050
	22,000	5,903,650	5,617,050
	23,000	5,843,650	5,557,050
	24,000	5,811,700	5,525,100
	25,000	5,837,500	5,550,900
	26,000	5,864,950	5,578,350
	28,000	5,926,450	5,639,850
	30,000	5,994,550	5,707,950
34,000	14,000	6,075,400	5,774,100
	16,000	5,955,400	5,654,100
	18,000	5,835,400	5,534,100
	19,000	5,775,400	5,474,100
	20,000	5,786,350	5,485,050
	22,000	5,829,700	5,528,400
	24,000	5,882,950	5,581,650
	26,000	5,944,450	5,643,150
	28,000	6,012,550	5,711,250
35,000	12,000	6,061,900	5,749,900
	14,000	5,941,900	5,629,900
	16,000	5,821,900	5,509,900
	17,000	5,765,200	5,453,200
	18,000	5,777,800	5,465,800
	20,000	5,814,550	5,502,550
	22,000	5,864,500	5,552,500
	24,000	5,921,050	5,609,050
	26,000	5,987,500	5,675,500
	28,000	6,057,250	5,745,250
36,000	10,000	6,056,650	5,737,650
	12,000	5,936,650	5,617,650
	14,000	5,816,650	5,497,650
	15,000	5,769,850	5,450,850
	16,000	5,774,200	5,455,200
	17,000	5,786,800	5,467,800
	18,000	5,804,350	5,485,350
	20,000	5,847,700	5,528,700
	22,000	5,900,950	5,581,950
	24,000	5,962,450	5,643,450
	26,000	6,030,550	5,711,550
38,000	8,000	$5,959,150	$5,617,850
	10,000	5,839,150	5,497,850
	11,000	5,790,700	5,449,400
	12,000	5,788,450	5,447,150
	13,000	5,787,850	5,446,550
	14,000	5,792,200	5,450,900
	15,000	5,804,800	5,463,500
	16,000	5,822,350	5,481,050
	18,000	5,865,700	5,524,400
	20,000	5,918,950	5,577,650
	22,000	5,980,450	5,639,150
	24,000	6,048,550	5,707,250
40,000	2,000	6,106,600	5,744,800
	4,000	5,986,600	5,624,800
	6,000	5,868,250	5,506,450
	8,000	5,819,200	5,457,400
	10,000	5,806,450	5,444,650
	11,000	5,805,850	5,444,050
	12,000	5,810,200	5,448,400
	14,000	5,840,350	5,478,550
	16,000	5,883,700	5,521,900
	18,000	5,936,950	5,575,150
	20,000	5,998,450	5,636,650
	22,000	6,066,550	5,704,750
42,000	0	6,078,400	5,711,100
	2,000	5,963,350	5,596,050
	4,000	5,886,250	5,518,950
	6,000	5,837,200	5,469,900
	8,000	5,824,450	5,457,150
	10,000	5,828,200	5,460,900
	12,000	5,858,350	5,491,050
	14,000	5,901,700	5,534,400
	16,000	5,954,950	5,587,650
	18,000	6,016,450	5,649,150
	20,000	6,084,550	5,717,250

FIG. 6. Computed cost summary for purchase and production of gas for various combinations of contract demand and winter service quantities.

Selection of Optimum Contract Demand, Winter Service Demand, and Production Capacity

An example may best serve to show a method of selecting the combination of supplies for least overall annual cost of gas to be purchased and produced.

Assume the following conditions:

1. Normal weather expectancy.

2. Average base load for season = 10,000 Mcf per day. Average heating load for season = 1000 Mcf per degree day.

3. Contract demand gas available at $4 per month demand and $0.35 commodity without minimum commodity charge or load factor restriction.

4. Winter service contract available at $1 per Mcf and a minimum winter bill based upon 60 days use of demand.

5. Existing manufacturing or LPG-air capacity sufficient to meet requirements so that fixed charges will not be an incremental cost and therefore not a determinant in computing optimum values. Direct production costs are assumed to be $2 per Mcf of equivalent natural gas.

Fig. 5 is a sample computation of annual gas costs for various combinations of contract-demand, winter service demand and manufactured peak shaving. An arbitrarily selected demand is shown on *Line No. 1. Line No. 2* is a trial value of the winter service daily quantity. T_1 is the temperature at which the firm contract demand is equal to the requirements.

To determine T_1, the average daily base load is subtracted from the demand, and the result is divided by the factor representing heating sendout per degree day. The quotient is the number of degree days which the contract demand will span. Subtracting from 65 produces the temperature, T_1.

To obtain T_2, the temperature at which both contract demand and winter service daily quantity combined will meet the load, the winter service daily quantity is divided by the heating factor and the quotient is subtracted from T_1.

Using the computed values of T_1 and T_2, corresponding values of D_1 and D_2 are found from the curve of degree days vs. temperature, shown in Fig. 4 and entered, as on lines 5 and 6.

To obtain the *total peak shaving*, D_1 is multiplied by the heating factor, as on line 7.

To obtain the *manufactured peak shaving*, D_2 is multiplied by the factor, as on line 8.

The difference between lines 7 and 8 is the **required** seasonal quantity shown on line 9. The **available** seasonal quantity, in this case 60 times the daily quantity, is entered on line 10. If this quantity is equal to or greater than line 9, no entry is made on line 11. If, however, there is a deficiency, it is entered on line 11. Such deficiency, if any, must be manufactured and is added to line 8 to obtain the total production required. This has been entered on line 12.

Line 13 is the annual natural gas required and is determined by first computing the total annual supply required for firm load, which is 365 times the average daily base load plus the product of the average heating factor and the total seasonal degree days. The natural gas component is determined by subtracting gas produced and the annual contract winter quantity.

Application of the appropriate rates will then produce an estimate of total purchase and production costs for the assumed values of contract demand quantity and winter service daily quantity. By repeating for other trial values and plotting costs against the variables, the optimum set of values may be determined. These costs, as derived in the sample computation, have been tabulated in Fig. 6 and have been plotted as a family of curves in Fig. 7. The lowest point on any of the curves is, of course, the optimum point. This occurs, in our hypothetical curves, with a demand of 35,000 Mcf, a winter service daily quantity of 17,000 Mcf, and a required peaking capacity of 23,000 Mcf.

In practice, it is desirable to actually contract for a slightly larger volume of firm gas than the theoretical optimum in order to compensate for over-

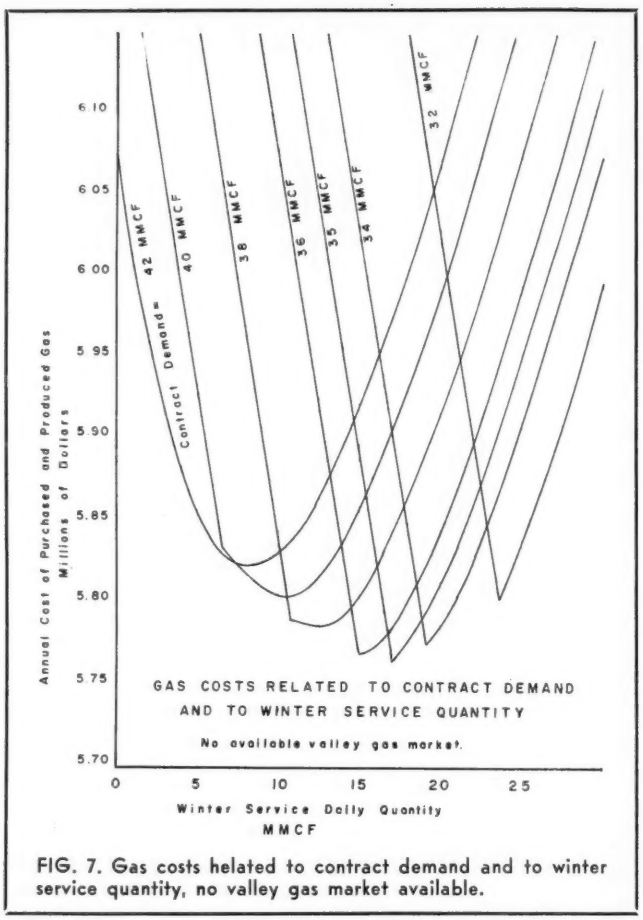


FIG. 7. Gas costs helated to contract demand and to winter service quantity, no valley gas market available.

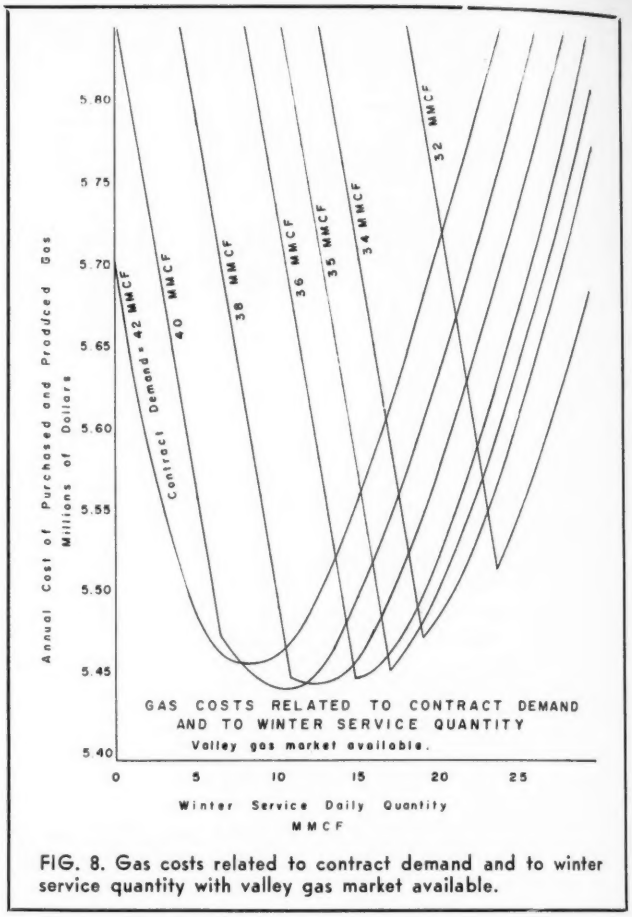


FIG. 8. Gas costs related to contract demand and to winter service quantity with valley gas market available.

shaving which may result from erroneous weather forecasts, and also for the fact that peaking requirements will generally be higher than an analysis indicates, because of higher average wind velocities and the shorter hours and lower angle of the sun in the midwinter.

Many factors can influence the optimum combination of demand, winter peaking service, and production. Any specific situation would have to be analyzed individually, taking into consideration the cost elements and limitations pertaining to contract demand and winter service gas, as well as storage and production operations.

Also affecting the optimum combination are such factors as automatic cost-of-service adjustments in customers' rates and the availability of a valley gas market, such as interruptible industrial customers, or the use of valley gas for electric generation in combination companies.

The effect of a valley gas market has been analyzed as part of this study of a hypothetical situation. In addition to the conditions assumed in the previous analysis, it was then assumed that there was an interruptible load of 15,000,000 cu ft per day. Referring to Fig. 2, a duplicate of the load duration curve, the cross hatched area represents the available annual valley gas for a 15,000,000 cu ft per day load.

Release of the first small portion of interruptible gas would normally be at or just above the peak shaving temperature, T_1. The full 15,000,000 cu ft per day load could be satisfied at all temperatures above T_3, where T_3 is determined by adding to T_1 the quotient of the 15,000,000 cu ft per day load divided by the sendout factor of 1000 Mcf per degree day. Between temperatures T_3 and T_1, there are a number of degree days computed as D_3 minus D_1 for which the heating load requires contract demand gas.

The total gas available at 100 percent annual load factor between these temperatures is 365 times the difference in temperature multiplied by the heating factor.

Subtracting the degree days, $D_3 - D_1$, from the product of 365 times the temperature difference results in a measure of available valley gas. This difference multiplied by the heating factor determines the volume of available valley gas which can be sold seasonally to the 15,000,000 cu ft per day load.

It has been assumed that this gas is sold at $0.45, which is a profit of $0.10 over the $0.35 commodity cost. In order to reflect the effect of interruptible load on the economics of purchase and production, this profit has been treated as an expense credit rather than additional revenue, and a new adjusted cost of purchase and production for firm load has been computed on line 26 of Fig. 5.

This data has been plotted in Fig. 8 and shows that the valley gas market has increased the optimum demand from 35 MMcf per day to 40 MMcf per day and decreased the optimum winter service from 17 MMcf per day to 11 MMcf per day.

Conclusions

The results of a specific analysis will depend upon the supplier's contract-demand and winter service rates, including the effect, if any, of load factor limitations or minimum charges. It will depend also upon the cost of producing peak shaving gas including, where applicable, fixed charges on new capacity investment, upon the normal weather pattern for the area served, and upon the extent of valley gas markets.

Each specific problem in peak shaving economics must be analyzed on its own merits. In many instances it will be found that there is a combination of peak shaving production and winter natural gas service that will result in better economics than either source alone.

Acknowledgment

This article adapted from a presentation made at the 1959 A.G.A. Production Conference. * * *

Housewife Can Now Choose From Variety Of Accessories to Customize Her Gas Range

CUSTOMIZED GAS RANGES with accessories to fit her exact needs are now available to Mrs. Average Homemaker —allowing her to buy the family gas range in the same manner that her husband can purchase an automobile with all the "extras" he wants.

Considered revolutionary by the industry, the customized gas range idea was recently introduced by Crown Stove, a Chicago gas range manufacturer.

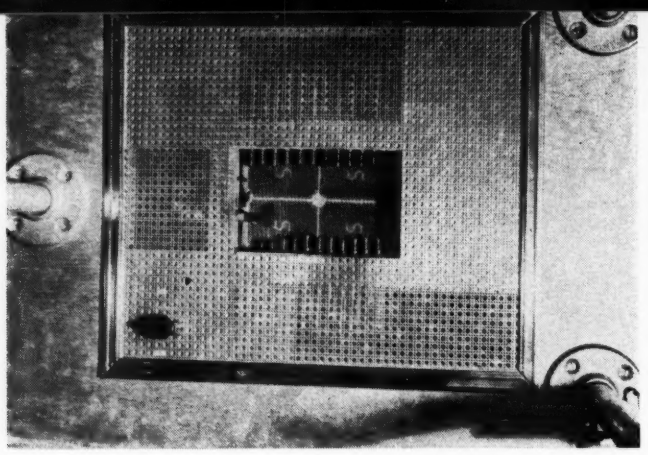
With seven basic gas range models to choose from, Mrs. Homemaker can select any one or all of a variety of accessories to be built into the gas range of her choice. Actually, there are 800 different combinations available under the customized plan, the manufacturer points out, including 30-in., 36-in., and 40-in. ranges.

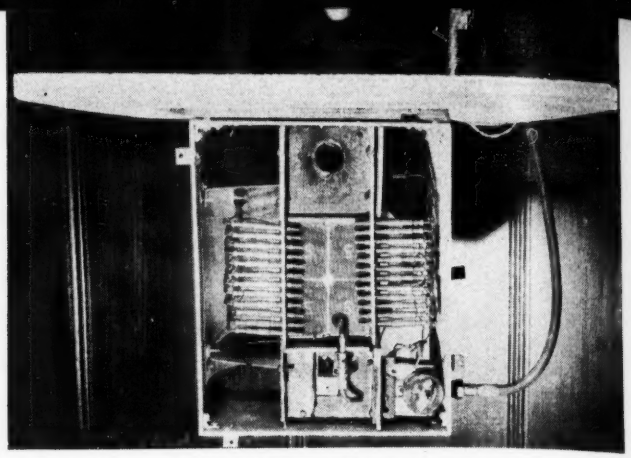
The custom line is competitive in price with other quality gas ranges.

Once the purchaser has selected her basic model along with accessories, Crown then proceeds with manufacturing operations. When completed, a gold-plated metal plate bearing the buyer's name is attached to the range, stating that it was custom built for her. Delivery time (in Chicago) is 7 to 10 days; transportation time must be added for deliveries to other areas.

Accessories available under the plan include a rotisserie in the oven, a glass panel in either or both the oven and broiler doors, a griddle and fifth burner or a thermostatically controlled griddle and fifth burner, an automatic oven clock control, one or more top burners with thermostatic control, a roast-master with chime signal, or a meat thermometer, and either a standard or deluxe instrument panel. * * *

With seven basic models to choose from, the housewife can select any one or all of the optional accessories on the floor in front of her to be built into the gas range of her choice. Some 800 different combinations are available under the customized plan, which includes 30-in., 36-in., and 40-in. ranges.





Installed in ceiling (left), experimental heater looks like this with only radiant burner and ornamental screen visible. Screen dimensions are 13 by 15⅝-in. Ends of the 24 thermocouples extend into burner radiant area. Thermocouples — connected in series to drive a Calrod Motor No. 4 with a shop-made fan blade mounted on motor shaft — supply 0.45 amps at 1.4-v. for an input of 0.63 watts as presently installed. Motor speed is 2100 to 2300 rpm; air circulation is 14½ cu ft per min. **Lower side of unit** (right) is shown before installation and attachment of ceiling screen. Two banks of power thermocouples can be seen on either side of radiant burner. Entrance to exhaust system can be seen lower center.

NEW IDEAS IN UTILIZATION

All-Gas Ceiling-Mounted Bathroom Heater Generates Own Electricity To Operate Fan

GAS-FIRED BATHROOM HEATERS that generate their own thermoelectric energy to power a built-in air handling fan and eliminate need for outside electrical energy sources can no longer be considered "wishful thinking."

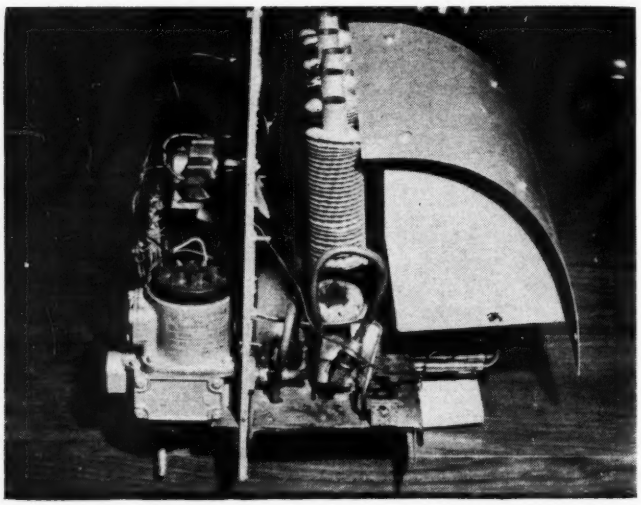
This new concept in heating apparatus—in which all electrical, mechanical, and heat energy comes from one source, gas — has been designed and successfully demonstrated by research and development engineers at Lone Star Gas Company in Dallas.

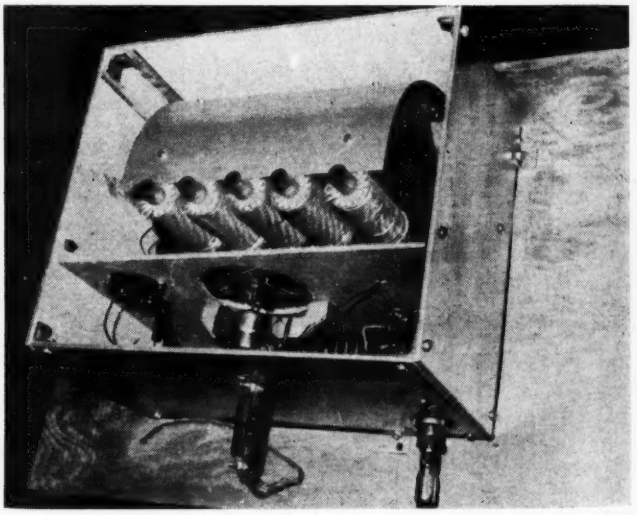
The unit they have developed combines an infra-red radiant burner—used as the heat source—with a series of 24 small thermocouples—that generate the required thermoelectric energy. The electric power thus created is used to operate a built-in air handling fan that increases the unit's efficiency by recovering a portion of the exhaust heat. Automatic valve controls are also operated by thermoelectricity.

Representing a distinct departure from conventional bathroom heaters, the new unit is designed for ceiling installation, thus freeing congested wall areas.

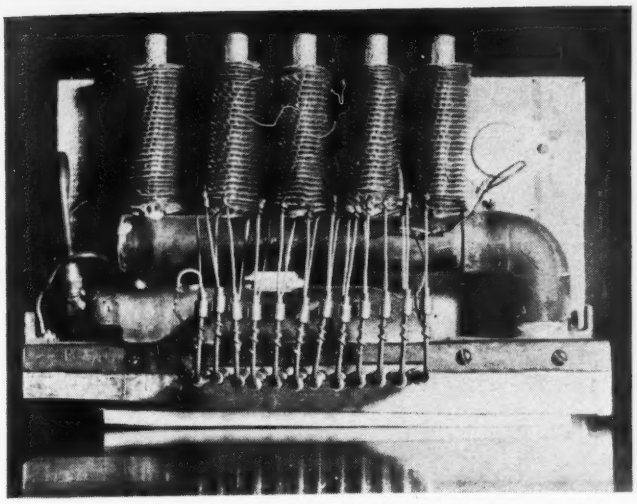
Operating on either natural gas or LPG, the single-utility heater demonstrates a principle recently announced by A.G.A., which has tested the use of thermoelectricity to drive an air handling fan. A.G.A.'s announcement noted that the possibility of being able to generate electricity by heat at the point of use opened up "entirely new design concepts for gas appliances, promising even greater convenience and comfort."

Thermoelectric source used in the Lone Star bathroom heater is of the same type announced by the Atomic Energy Commission last January for use in space satellites, using an atomic fuel known as Polonium 210. The commission report described the nuclear auxiliary power generating device, known as "Snap III," as "a significant breakthrough because of its high efficiency, generating stamina, and absence of moving parts." The same improved thermocouples are used in the Lone Star unit with natural gas instead of atomic fuel used to heat the thermocouples.

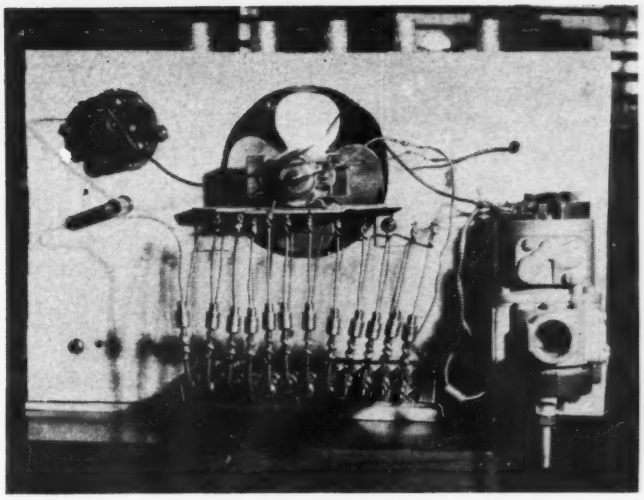




Gas inlet end of heater (left) is shown with side view of finned-type heat exchangers, which were cut from one 5-ft tube to lengths of 5½-in. each. **Internal arrangement of heater** (right) looking into it from above installation point, shows cover removed and compartment housing heat exchange surface, sensing element of the temperature cut-out, and hood that directs air from the fan back into the room, at top. Smaller compartment serves as circulating air inlet duct and contains gas valve, fan motor, and body of the excess temperature cut-out-switch.



Circulating air outlet and exhaust heat exchanger side is shown in this photo with the hood, which directs air from the fan back into the room, removed. Heat path is from other side of unit through fins in these heat exchangers and down into the bathroom.



Circulating air inlet side of heater shows cold air junctions of one series of thermocouples, fan motors, and gas valve, (lower right). Body of the excess temperature cut-out switch is shown upper left.

The small, radiant type burner in the experimental heater supplies a high concentration of infra-red heat. Its high efficiency and low-cost operation have made it particularly adaptable to many types of commercial and industrial use.

Its versatility makes it ideal for ceiling installation in heating large or small bathrooms because of its instant warming action despite relatively low ambient or surrounding air temperatures.

The radiant type burner in itself is a highly efficient heat source with more than 50 percent of the heat produced reflected directly into the area to be heated. The burner was conceived and developed by Guenther Schwank, a German designer of gas appliances.

Lone Star's experimental unit adds to this efficiency by using the air handling unit to recover an additional 25 percent of the heat that might otherwise be lost. Stack temperature is minimized by this heat recovery system, being reduced from 1000 F at the burner outlet to 228 F at the stack outlet. The fan circulates incoming cold air over the cold junctions of one set of thermocouples and blows it over a series of five small, finned-tube heat exchangers connected to the horizontal exhaust header for the additional heat recovery.

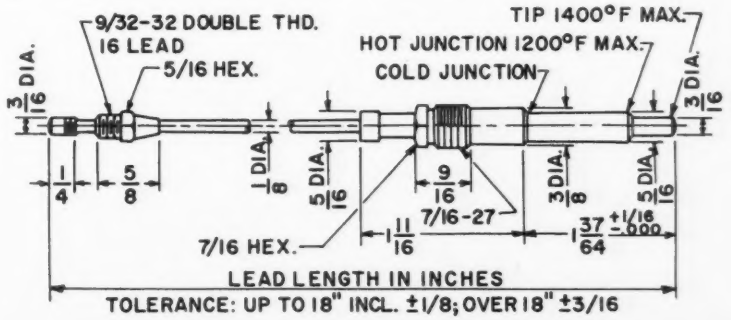
The burner has a constant-burning gas pilot with the main valve controlled by means of a simple wall switch. Wiring to this control point is low voltage, low amperage, and offers no electrical hazards, the engineers point out, due to use of self-generated thermoelectricity.

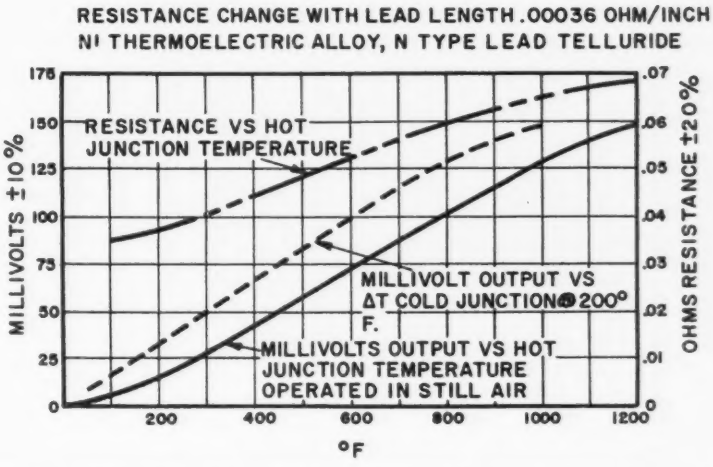
The entire unit is contained in a two-compartment box with component parts mounted on a common base. When installed in the ceiling, the only portion of the heater visible is the 5½-in. by 3½-in. burner grid and its surrounding ornamental screen measuring 15⅝-in. by 13-in. The box above the screen is 12-in. wide, 14½-in. long and 8¾-in. deep.

The Schwank burner is rated 4800 Btu per hour input. The burner pilot is match-ignited just once—in the autumn—by holding the valve handle against spring tension until the thermal element becomes hot. This valve provides complete shutoff of both main burner and pilot in the event of pilot failure and permits remote operation of the main gas valve through the on-off switch or thermostat.

Although the experimental unit is not equipped with a radiant heat reflector around the burner, Lone Star's engineers have suggested that a well-designed reflector would be desirable in a production model.

Cost of the pilot model, although relatively high, does not reflect true cost based on mass production. Retail price of the motor used in the experimental unit is $1.95. The lead telluride thermocouples, of which 24 were used, cost $4.50 each, but engineers state that these are now available at about $2 each to heater manufacturers. If further improvements in manufacturing could reduce the cost to 50 cents each, the economy factor should become more acceptable to manufacturers and purchasers. * * *





Operating data of the lead telluride thermocouples, manufactured by Baso, Inc., are given above.

Selecting, Training, and Testing Distribution Welders

Gordon G. Dye,
Manager of Distribution
Southern California Gas Company
Los Angeles, California

AT ONE TIME, SOUTHERN CALIFORNIA GAS COMPANY followed the practice of hiring from outside welders who could fully meet company standards — unless there were fully qualified employees who could be promoted. During and following the war, it was practically impossible to hire fully qualified welders and it became necessary for the company to do a great deal more training of employees in order to obtain an adequate number of welders.

An important factor in determining welder training requirements is the way in which welders are used. This depends on many things — such as the size and type of system, the amount of personnel turnover, and contractual agreements. In our particular situation, we believe it is easier and cheaper to qualify welders for a rather wide range of work than it is to set up different qualification standards and screen work accordingly. This, of course, might not be true for other companies where conditions differ from ours.

Distribution welding includes both the acetylene process and electric arc welding. Electric welding is used for pipe 6 in. and larger in diameter or when the pressure in an existing line is more than 125 psi. There are exceptions to these generalities, however.

It might be helpful to explain that Southern California Gas Company's welder classification is very broad. In addition to welding, welders build, alter, or repair meter set assemblies; install and operate pressure control equipment; test for and repair leaks; install valves, clamps, and fittings, and perform other assignments. This, of course, helps materially in assigning work and balancing crews and it makes it feasible to use a welder as a member of the crew.

Welder Qualification

Acetylene welders are qualified to make butt welds on steel pipe up to and including 6 in. diameter and fillet welds on pipe up to and including 12 in. diameter, with wall thicknesses from 0.113 in. through 0.375 in. Acetylene welders also join copper pipe with hard solder, braze service tees to cast iron mains and perform simple layout work. Arc welders can do all phases of acetylene welding plus electric welding on steel pipe from 3 in. to and including 12 in. diameter with wall thicknesses from 0.188 in. through 0.500 in. When the need arises, welders are specially qualified to work outside these limits.

From the quality standpoint, all welders are required to produce welds that have substantially full penetration, complete fusion, a neat appearance and that develop the full strength of the

Southern California Gas Company
Distribution Department

ANNUAL ELECTRIC WELDING BRUSHUP TRAINING REPORT

Name_____ Classification_____ Date_____

District_____ Test Location_____

Operation	Four Hour Test Results		Results at End of 4 Hour Brushup		Comments
	Satisfactory	Unsatisfactory	Satisfactory	Unsatisfactory	
1. Fillet Welding					
1.1 Weld half sole to top half of 6" pipe.					
1.2 Weld half sole to bottom half of 6" pipe.					
1.3 Weld 3/4" or 1" nipple to 3" or 4" pipe. Nipple in vertical position.					
1.4 Weld 2" pipe as side outlet tee to 6" pipe.					
2. Butt welds.					
2.1 Butt weld 6" nipples in bell hole position.					

Observance of safety precautions: Satisfactory_____ Unsatisfactory_____

Remarks:_____

_____ (Instructor)

_____ (Noted)

FIG. 1. Annual electric welding brushup training report.

pipe even though normal distribution line pressures are usually in the 10 to 25 psi range.

By qualifying distribution welders at a higher level of proficiency than is really needed for small diameter, low stressed pipe, a great deal of flexibility is gained in assigning work as mentioned previously and the margin of safety for the welding is increased. This, together with the fact that the inspectors and field supervisors have been trained to detect "drifts" in techniques and to request tests or brush-up training before the welding becomes unsatisfactory, insures high quality.

Welding Training Section

The welding section of "distribution training" consists of a supervisor and seven instructors. The instructors are all familiar with the welding problems of the distribution system because each has spent considerable time as an acetylene welder before being selected as an instructor. Several of them have also worked as electric arc welders.

This group is responsible for carrying out the welding program of training, testing, and field inspection, and is capable of developing and conducting training in any welding process or procedure the system may require. It prepares training "props" and does the experimental and developmental work needed for instruction on new welding procedures.

Selection of Trainees

At Southern California Gas Company, seniority is observed in promotions where ability and qualifications are sufficient to meet the standards of the job to be filled. One of the factors used to determine the qualification is the amount of training for the job ahead that the employee has completed. We used this to develop a plan that gives incentive to employees to study and practice welding on their own.

Under this plan each candidate takes a series of tests and is classified in one of five groups. (These groups correspond to the groups indicated on the *Acetylene Welder Qualification Test*, Fig. 2.)

Southern California Gas Company
Distribution Department

ANNUAL ACETYLENE WELDING BRUSHUP TRAINING REPORT

Name_____ District_____ Date_____

Classification_____ Test Location_____

Operation	Four Hour Test Results		Results at End of 4 hour Brushup		Comments
	Satisfactory	Unsatisfactory	Satisfactory	Unsatisfactory	
1. Set up welding outfit and explain proper step by step procedure of this operation.					
2. Fillet welding.					
2.1 Weld half sole to bottom of 3" or 4" pipe					
2.2 Weld half sole to top half of 3" or 4" pipe					
2.3 Weld 3/4" or 1" nipple to 3" or 4" pipe					
3. Butt weld 3" test nipples in bell hole position.					
4. Hard soldering.					
5.1 3/4" Bell Joint 5.11 Bell copper					
5.12 Clean copper					
5.13 Apply solder					
5. Layout					
6.1 Angle Miter 6.11 Layout and Mark					
6.12 Cut and Fit					
6.2 3" x 4" Saddle Tee 6.21 Layout and Mark					
6.22 Cut and Fit					

Observance of safety precautions: Satisfactory____ Unsatisfactory_____

Remarks:_____

Instructor:_____ Noted:_____

FIG. 2. Annual acetylene welding brushup training report.

A. **Group 1.** Employees who are fully qualified.

B. **Group 2.** Employees who meet the welding qualifications but who need training on certain specific job requirements such as pipe layout and repairing a hole in a live main by welding.

C. **Group 3.** Employees who can demonstrate the ability to set up the welding equipment and maintain the proper torch adjustment for cutting and welding and who can satisfactorily bevel cut, tack weld, and butt weld 3-in. pipe.

D. **Group 4.** Employees who can demonstrate the ability to set up the welding equipment and maintain the proper torch adjustment for cutting and welding.

E. **Group 5.** Employees with no specific knowledge of welding equipment or procedure.

Selection is made from the men in the group requiring the least training, first on the basis of seniority from present employees and then from any prospective employee who has qualified in that group. Thus, it is possible that a newly-hired man can be selected if he requires substantially less training to qualify than any present employee.

For example, an applicant in Group 1 can be hired instead of completing the training of an employee in Group 2 or lower. If no one with any welding ability were available, the man in the next lower classification with the most seniority, satisfactory performance in

SOUTHERN CALIFORNIA GAS COMPANY
Distribution Department

Acetylene Welder Qualification Test

Name _____ District _____

Department _____ Date _____

GROUP	OPERATION	PASSED	FAILED	COMMENTS
IV	1. Set up equipment Procedure Safety			
	2. Regulator adjustment For Cutting For Welding			
	3. Torch adjustment For Cutting For Welding			
	4. Make straight cut on 4" pipe using wrap around			
	5. Make bevel cut on 4" pipe using wrap around			
	6. Maintain weld puddle on top quarter of outer surface of 4" pipe			
III	7. Tack weld 3" nipples Spacing Procedure			
	8. Butt weld 3" nipples in bell-hole position			
II	9. Fillet weld 4" half sole to top quarter of 4" pipe			
	10. Fillet weld 4" half sole to bottom quarter of 4" pipe			
I	11. Burn hole in live main and repair by welding			
	12. We'd 1" tee on 3/4" main			
	13. Weld 1" tee on side of 4" main			
	14. Weld canopy with air test nipple on 2" main			
	15. Layout, mark and cut 3" branch connection to 4" header			
	16. Layout, mark and cut 45° angles around vault using 2" pipe			
	17. Hard solder 3/4" copper bell joint			

Instructor _____ Noted _____

FIG. 3. Acetylene welder qualification test.

his present job, and the necessary basic background would start training from scratch. Many employees take welding training in trade or public schools at night and thereby place themselves in a more favorable position for promotion. Currently most of our trainees are obtained from Group 3.

Training Company Welders

Both the acetylene and the electric welding courses start with the principles of welding and cutting and a thorough indoctrination in safe handling of welding equipment and material. Training progresses in steps from simple welding exercises such as straight and bevel cuts and bead welds to fillet and butt welds. Complete course outlines are shown in Fig. 4 and 5. One instructor can train up to six trainees at a time. Before completing the course, the trainee must consistently make welds under field conditions which pass the standard tensile, bend, and soundness tests. Furthermore, he must have acquired good welding techniques and habits.

Since a great deal of our work consists of welding service tees and pressure control fittings on operating lines, the trainee works in simulated bell holes. Most trainees have some concern about "burning through" when welding on live lines, so to dispel their fears and teach them how to cope with such a situation when it arises, they are taught to burn through a line carrying gas at 15 psi and then repair the leak. After that, the trainee practices other operations on live lines, including acetylene welding a tee on a line carrying gas at 125 psi.

Training in controlled fire cutting and welding procedures is includeu in the electric welding course. This procedure for removing and installing sections of line was developed in the gas industry. It requires that cutting and welding be done while the line is under enough gas pressure to prevent air entering the line, eliminating the possibility of forming an explosive mixture. To assist in training in this operation a replica of a field bell hole is used. In this "fake" bell hole electric welder trainees practice controlled fire cutting and welding until they are thoroughly familiar with the procedure.

At the conclusion of the training, the welder has mastered good techniques and is able to pass our qualifying tests. This does not mean, however, that he is an accomplished operational welder. He is a quality welder but may be very slow. It now becomes the responsibility of the field supervisor to continue the welder's training to improve his production and adaptability to field problems by working with him in the field. To help the supervisors do this, they have been trained to recognize proper welding techniques and to visually evaluate the quality of welds as they are being made.

Testing Company Welders

To remain qualified to weld on distribution lines, each welder must pass tests of his production welds at least once each six months or pass the complete requalification test at least once each 12 months.

The second alternative is used for company welders. Our annual welding brushup program requires that each of the 275 distribution department welders spend at least one day with an instructor taking the complete requalification test. This includes fillet and butt welding, hard soldering, and layout work. Arc welders take both the acetylene and electric welding tests.

In cases where the instructor notices a questionable technique, or some phase of the test indicates that the welder is not welding at maximum efficiency, the fault is corrected before the welder returns to operational welding. Thus we are able to pick up first indications before they develop far enough to result in unacceptable welds. Each man is allowed a maximum of 40 hours of brushup training. If he fails to meet the standards in 40 hours, he receives no more instruction on company time, but is given 60 days to improve his welding. During this period, he is not demoted but is kept on an assignment that does not require welding. At the end of 60 days, if he cannot qualify, he is demoted to the next lower classification.

It is seldom, however, that any welder requires more than eight hours of brushup training. This program has been in effect now for several years. The welders seem well pleased with the training because they realize it is intended to help them keep their welding quality at a high level. Furthermore, they appreciate the opportunity to improve their welding techniques

SOUTHERN CALIFORNIA GAS COMPANY
Distribution Training Department
Outline of Oxy-Acetylene Pipe Welding
Training Program

Objective = To Teach Pipe Welding

OPERATIONS

I SAFETY
1. Set Up Welding Outfit
2. Safe Working Pressures
3. Handling and Storage of Cylinders
4. Good Housekeeping

II CUTTING
1. Regulator Adjustment
2. Torch Adjustment
3. Cleaning and Care of Torch
4. Straight Cut on Steel Plate
5. Straight Cut on 4" Pipe
6. Bevel Cut on 4" Pipe

III WELDING
1. Regulator Adjustment
2. Torch Adjustment
3. Cleaning and Care of Torch
4. Welding a Bead on Top of a 4" Pipe
   a. Without a Rod
   b. With a Rod
5. Tack Welding - Pipe Size 2", 3" & 4"
6. Butt Welding - Pipe Size 1", 2", 3" & 4"
   a. Rolling
   b. Overhead
7. Fillet Welding
   a. Half Soles - Pipe Size 4"
   b. 1" Service Tee - Pipe Size 3/4", 1", 2" & 4"
   c. Reducer Weld 3/4" to 1-1/4"

IV WELDING ON LINE MAIN PIPE SIZE 4"
1. Repair Leak

V BELLHOLE WELDING ON LIVE MAIN
1. 1" Tee on 2" and 4" Main
2. 1" Tee on Side of 4" Main
3. Half Sole with Test Nipple on 4" Main
4. Canopy with Test Nipple on 2" Main

VI LAYOUT
1. Miter Angle with 3" and 4" Pipe
2. Branch Connection
   a. 3" to 4" Pipe
   b. 4" to 4" Pipe
   c. 4" to 6" Pipe
3. 45° Angle Around Vault Pipe Size 2"

VII COPPER
1. Bell Joints - Pipe Size 1" & 2"
2. 2" Copper Service Tee
3. Brazing
   a. Flat Steel
   b. Flat Copper
   c. Copper to Steel Overhead

FIG. 4. Outline of oxy-acetylene pipe welding training program.

SOUTHERN CALIFORNIA GAS COMPANY
Distribution Department
Outline of Electric Welding
Training Program

Objective - To Teach Electric Welding (Vertical Down Method)

OPERATIONS

I. SAFETY
1. Protective clothing
2. Helmet and flash goggles
3. Protect others from flashes
4. Good housekeeping

II. WELDING MACHINE
1. Maintenance
2. Current - D.C. Straight and reverse polarity
3. Current adjustment
4. Starting and stopping

III. WELDING RODS
1. Brief explanation

IV. WELDING PRACTICE - (Fillets)
1. Striking the arc
2. Welding bead on flat plate
3. Welding bead on vertical plate
4. Cleaning weld
5. Weld fillet on flat plate
6. Weld fillet on vertical plate
7. Weld bead on top quarter of pipe
8. Weld fillet on top quarter of pipe
9. Weld fillet from top to bottom 8" pipe or larger
10. Test fillet by use of wedding band (air test)

V. WELDING PRACTICE - (Saddles)
1. Weld 4" to 6" saddles on top, 6" to 10", etc.
2. Weld 4" to 6" saddles on side, 6" to 10", etc.
3. Weld 4" to 4" saddles on top, 6" to 10", etc.
4. Weld 4" to 4" saddles on side, 6" to 10", etc.
5. Visual test

VI. SERVICE TEES
1. Distribution service tees
2. High pressure service tees
3. Visual test

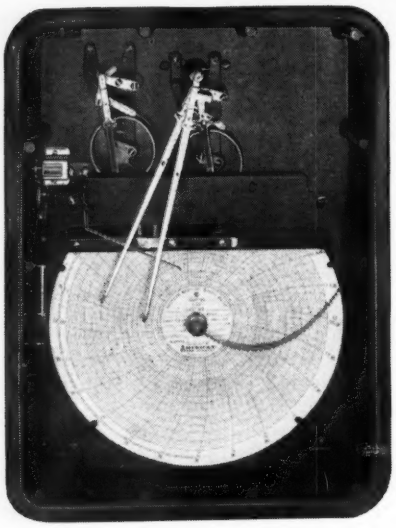
VII. PATCHES
1. How to prepare
2. How to weld on a live main
3. Air test

VIII. BUTT WELD
1. 6" - 3" standard wall
2. 6" - 3" .188 wall
3. Physical and visual tests

IX. LAYOUT
1. Saddles equal size 16 point method
2. Weld ell
3. Demonstrate layout problem (No test)

X. WEDDING BANDS ON LARGE PIPE
1. Use 3/16 rod. (no test)

FIG. 5. Outline of electric welding training program.



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and to get new and up-to-date information from competent instructors.

An interesting sidelight on the annual brushup is that each year we find two or three welders who are beginning to have trouble because their eyesight is failing. Glasses are recommended and this generally corrects the problem at once.

Testing Contract Welders

There are between 200 and 225 contract welders working our distribution lines. Although the company does not train these contract welders, they are qualified and requalified according to the departmental standards. Qualification tests similar to those given to company welders are conducted at several locations throughout the system.

Contract welders are usually requalified by taking samples of production welding once every six months. Every effort is made to take the sample at a time when it will not hold up the job. If there is some reason, however, to question the quality of the welding, a number of welds may be cut out and tested. The instructors' cars are equipped with portable tensile and bend testing machines so that weld tests can be made at the job site. This has proved to be a very satisfactory procedure for conducting field tests. There seldom is any question about the results of the tests because the welder and his supervisor are present and can observe the procedure and examine the test coupons. The cost for removing welds and rewelding is paid for by the contractor if the welds prove unsatisfactory and by the company if they prove satisfactory.

Other Test Methods

Radiography is used to test the quality of arc welds on large diameter, high pressure distribution trunk line installations. Our standards of acceptability are based on those of API 1104. Routine radiographic inspection is made by taking pictures of the percentage of the welds needed for quality control. Of course, additional radiographs are made when the inspectors request them. At present we do not own radiograph or X-ray equipment and company people do not operate such equipment. Instead, the complete service is contracted from an industrial X-ray laboratory that furnishes the inspection equipment and a technician who exposes and develops the films and interprets the results on the job.

Results of these tests are entered in the welder's file and treated like any other field test. Radiography alone is not used for original qualification tests, for we believe that much can be learned about a welder's ability from physical tests and from observing his welding technique. The instructor can explain and the welder can more clearly see and understand the good and bad characteristics of the weld.

The sample testing of welds by either radiography or physical tests is supplemented by two relatively inexpensive but very successful procedures for checking field weld quality. The field supervisors and inspectors have been trained to inspect welding visually and to evaluate weld quality by examining nick break test samples. The visual inspection includes checking the lineup, spacing and end preparation, watching the puddle for degree of fusion and size and shape of reinforcement, and observing the welder's technique and the electric current or torch adjustment.

In addition, each supervisor has an inexpensive test jig and can make nick break tests of welds in any size pipe at any time he thinks it worth while. In cases where the quality of welding seems to be drifting, the supervisor may request further testing and brushup training for company welders and further testing for contract welders. The fact that the welders know that their work may be tested at any time tends to keep weld quality high.

Records

The training section maintains a complete record of all welders, both company and contract. This record shows tests passed or failed, training given, etc., and, of course, indicates when the next requalification test is due.

Conclusion

It is apparent that this welding training and testing program is quite satisfactory in meeting our particular needs. For example, of 355 periodic tests given contract welders in the field in 1958, there were only 12 instances where welds did not meet the standards outlined in this article. Secondly, only 15 out of 275 company welders required more than the minimum eight hours of brush-up training.

Since instituting this plan, which encourages employees to learn welding on their own, the time necessary to train welders has been reduced by an average of 60 hours — from 320 hours to 260 hours average. Thus, while other companies may have equally effective programs or programs that better meet their conditions, we are confident we are getting high quality welding at a reasonable cost for training and testing.

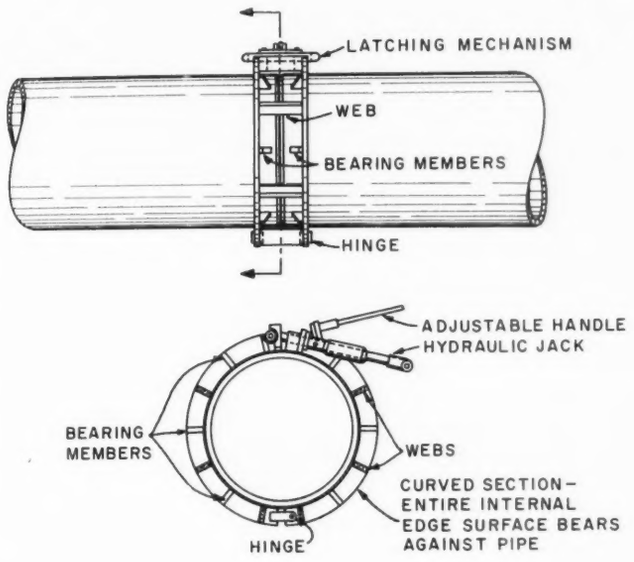
Acknowledgment

This article developed from a presentation made at the 1959 A.G.A. Distribution Conference. * * *

PATENT REVIEW

NEWS ABOUT NEW IDEAS FOR THE GAS INDUSTRY

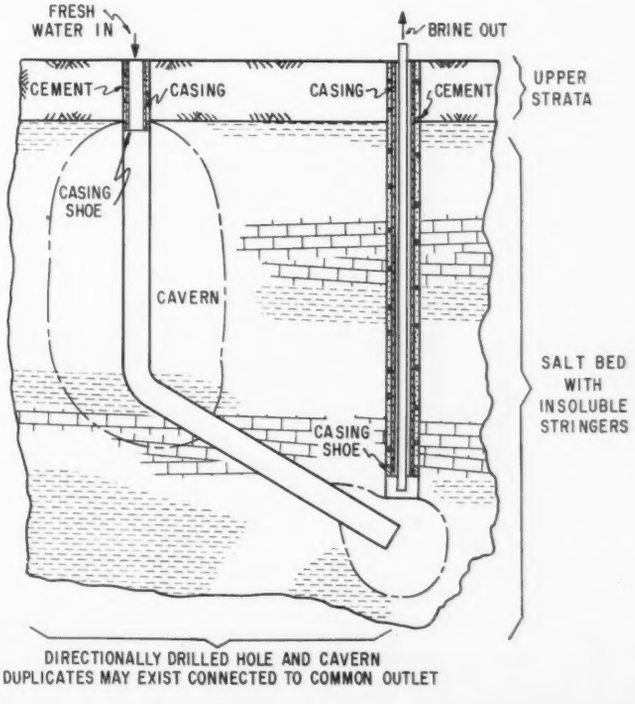
New Pipe Lineup Clamp May Be Tightened From Any Angle by Means of Special Handle on Hydraulic Jack Latching Mechanism



Newly patented pipe lineup clamp will not distort ends of the pipe sections, tends instead to correct any distortion the pipe ends may already have; offers the minimum interference with welding, and the maximum bearing surface around the pipe; provides a quick and easy method of aligning pipe ends; and allows operator to work from any angle using a special handle on the hydraulic jack latching mechanism. Clamp is composed of two semi-circular parts, hinged on one end, and which are latched by means of a hydraulic jack. Each part has two curved sections connected by webs, and supplementary bearing members, all of which grip the pipe continuously and hold it firmly in alignment. Each curved section provides maximum continuous contact with the pipe so that the clamp will not distort the pipe, but instead tends to correct any distortion the pipe ends may already have. After the latching mechanism has been engaged and the curved sections drawn together so as to move the pipe sections into substantial alignment with each other, a greater tightening force may be applied through use of the hydraulic jack, locking the pipe securely in place. A special handle arrangement on the jack allows operator to tighten the clamp from any position. *U. S. Patent, 2,888,895, (1959) June 2. John L. Coody, Johns S. Work and Eugene K. Bell; assigned to Paul Barkley.*

New Multi-Cavern Method for Underground Storage of LPG Uses Laterally Drilled Channels Radiating From Outlet Shaft

Improved method of forming a single or multi-cavern system for underground storage of LPG is claimed in a new method that involves drilling an inlet hole from the surface of the earth to a point in a soluble formation (generally salt); hole is then drilled at an oblique angle from this point to a deeper point in the formation to form a channel. A second (offset) well is then drilled to intercept this channel. Water entering the inlet well dissolves the salt (or other formation material) and percolates downward. This water with decreasing dissolving action, flows to the intercept well. From here, the brine can be pumped to the surface. Because the solution leaving the salt bed is relatively saturated, little or no salt around the base of the outlet well will be dissolved, and a minimum caving action occurs. The outlet well, therefore, is always clear for pumping out the stored hydrocarbons. Although cited specifically for salt formation, it is believed method can be used on certain shale beds that disintegrate in water. It may also be feasible to dissolve space out of massive limestone with hydrochloric acids. However, extensive occurrence makes salt deposits a favorite for preparation of underground storage caverns. Drilling sequence can be reversed so a vertical well is drilled first. Also, process is not limited to a 2-shaft arrangement; it is possible to arrange channels so that they are connected with the outlet shaft in any desired manner — for example, channels can be radiated like spokes of a wheel from the outlet shaft at the hub position. *U. S. 2,861,428 (1958) Nov. 25. H. V. Hendrix, assigned to Phillips Petroleum Company.*



Toward Better Management ONE OF A SERIES

How To Correct Employees

You can hold employee goodwill and still correct poor performance with this formula for criticism

H. E. Carroll

EMPLOYEE CRITICISM is a necessary part of successful gas company management. Regardless of how effective an employee is on his job, there are times when it is necessary to make some suggestions for improvement — to correct his errors or to encourage better performance.

Gas company managers agree on the necessity for correcting employees. But they also know that there is the danger that the criticism may boomerang. The corrected employee may not take your suggestion in the helpful way you intend it, and more serious employee relations problems may develop.

As you know, it is never a pleasant task to criticize an employee. It can be an ulcer producing problem that is avoided as long as possible. Then, at the breaking point the employee is criticized to release the tension.

Successful managers find that there is an easy and effective system of correcting employees. It points out the error and makes a suggestion for improvement. Most important, however, this formula holds the goodwill and the cooperation of the employee being corrected.

Reduced to an easy-to-apply formula here are the three steps:

1. **Compliment**
2. **Correct**
3. **Encourage**

This formula sandwiches the criticism between two happy thoughts — a compliment and a word of encouragement. And, by following this formula you you will have time to get into a friendly frame of mind rather than flying off the handle with quick words of criticism.

1. Compliment

A basic rule of this formula is to think of something good the employee is doing or has done in the past. It may take a few moments to think of this part of the formula, but the time helps take the edge off of your anger. And, if the employee has not been or is not doing anything that can be complimented, any effort on the part of management to offer corrective suggestions will be of little value.

You will find that your compliments are more effective if they are based on something unrelated to the criticism. For instance, if you plan to give a corrective suggestion on safety, you will find a compliment on something else like his cooperative attitude will be better than his former safety record.

One important suggestion about this part of the correction formula is: Don't be too brief in your compliment. If you do, it may sound like flattery rather than the compliment intended.

For instance, don't say: *Jim, you have a cooperative attitude, but . . .*" This brief compliment doesn't have time to sink in and soften the blow of the criticism that is to follow.

You can add substance to your initial compliment by citing a specific example. As you are thinking of the complete details of the example of the employee's cooperative attitude, you will have more time to develop a friendly approach. Thus, you will take the sting out of your corrective suggestion.

2. Correct

Many managers find criticism is accepted better by the employee when it is offered as a suggestion — not as a command. For instance, you might preface your correction with something like this: *"May I offer a suggestion?"*

Another helpful idea in applying the formula is to point out a benefit — something the employee will gain by following your suggestion. For example, you might stress the correct way is easier, safer, faster, etc. Any benefit that is easily seen by the employee can be used in this part of the corrective formula.

Thus, in this step of the formula you might say: *"May I offer a suggestion? I think you will find it a lot easier and far less dangerous. Here, let me show you."*

Next, you show the employee the correct way to perform the task. Do it slowly. Do not show too much skill yourself or the employee may feel it is too complicated and the suggestion will be lost.

As you are performing the operation, you will want to stress the main point. For instance, if safety is to be stressed, be sure your performance is handled safely. If speed is to be stressed, eliminate all lost motions in your instructions.

Finally, nail down the correction. One way is to have the employee repeat

(Continued on Page 29)

The MINIATURIZED-PRECISION WILKINSON Line Locator Model W-3

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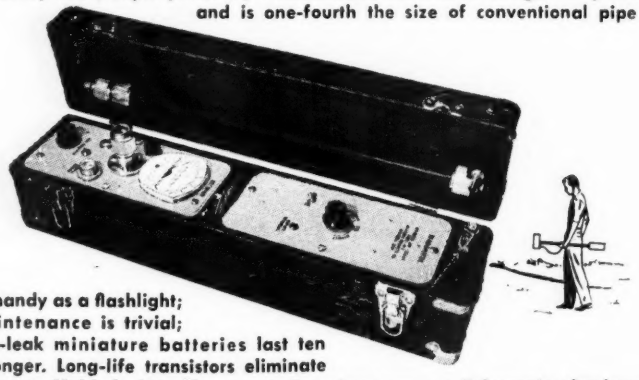

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DEVELOPMENTS TO WATCH

Plastic pipe for underwater crossings — extruded as laid. Fish Engineering Corporation, Houston, without saying it has the solution, has come up with an unusual idea on how to transport Sahara natural gas across the Mediterranean to European cities. Suggested as feasible is the use of plastic pipe which would be sufficiently flexible to follow the uneven sea bottom and which could be manufactured as it is laid from a converted-aircraft-carrier floating factory. Underwater crossings using plastic pipe in small diameters have been done before—on D-Day to supply fuel to Allied landing forces in World War II, and currently in offshore Louisiana, a 4-½ in. line has been laid for Shell Oil Company—however, for the Mediterranean application, the pipe would have to be at least 12-in. Even with this size, it is estimated eight lines would have to be laid to handle gas from a 36-in. land pipeline. Still unknown is whether 12-in. plastic pipe could withstand the external pressures of the 1500-ft depths occurring on one of the suggested pipeline routes between Oran, Algeria, to the southeast tip of Spain near Cartagena, or internal pressures of high pressure gas transmission.

Chicagoland's new supply line—Midwestern Gas Transmission Company — utilized new coating practices both internally and externally. It is the first complete line of this size (30-in.) to be internally coated almost completely with epoxy resin from end to end. Exteriorwise, approximately 60 percent of the 350-mile line was coated with hot coal-tar enamel. The other 40 percent was coated by two different tape techniques — one employing hot wax, plastic tape, and kraft paper; the other, a polyvinylidene chloride material tape, the inside of which is sticky butyl rubber, and felt. A newly developed dope machine which combines cleaning, coating, and wrapping operations in one unit (eliminating the cleaning machine that usually runs ahead of the dope machine) was used for applying both tape-coating techniques.

707 Jet Aircraft Engine to power new experimental compressor — Columbia Gulf Transmission Company has asked FPC approval to install at Clementsville, Kentucky, a new experimental Cooper-Bessemer 10,500 hp mainline compressor unit that will be powered by a modified jet aircraft engine. Prime mover of the unit is a Pratt & Whitney J-57 jet engine, the same now being used on the Boeing 707, that has been modified to use natural gas as fuel. It has already been operated successfully on the test stand driving a specially designed C-B power turbine and centrifugal compressor but the Clementsville installation will be its first industrial application. Construction is scheduled to begin February 1, completion by July 1, 1960. Success of the project is expected to prove a fully automatic and unattended compressor station powered by the unit, can be constructed for approximately 50 percent of the cost of a conventional automatic station. Another advantage is the extreme light weight of the unit—only 10 tons, compared to 356 tons for the 3 conventional engines that total 10,500 hp.

(Continued from Page 28)

your performance in the approved way. Check to be sure it is done correctly. Or, if it is a verbal suggestion, ask a positive question that gets agreement. For example, you might say, *"Don't you agree this way is easier?"*

3. Encourage

You can take some of the sting out of your criticism by ending with a word of encouragement. The employee is not left with the feeling he is inadequate — he develops confidence that he can do better in the future.

One technique is to compliment the employee on something from the past. For example, you might say: *"I know you can do this faster. You have been one of the top men in the department and I'll bet you will be leading again."*

When you use the compliment as a word of encouragement, though, be sure you do not use the same compliment you used at first.

Another technique is to repeat the benefits. For instance, after you have shown the faster, safer, and better way of performing the task, you may want to mention again what the employee will gain. You can say, for instance, *"Don't you agree this is an easier, faster, and safer way to do this?"* * *

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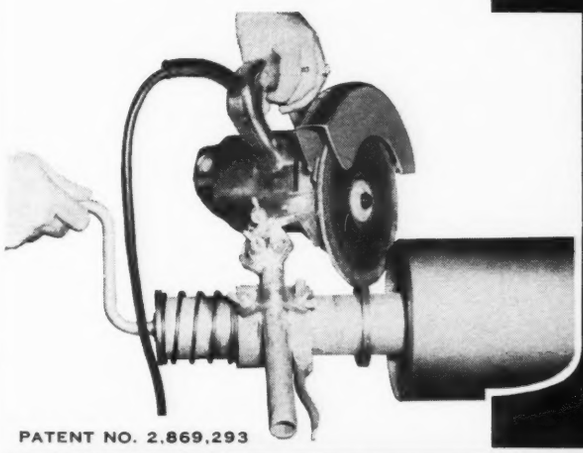

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COMING EVENTS IN THE GAS DISTRIBUTION INDUSTRY

November

2- 5 11th Exposition of the Air Conditioning & Refrigeration Industry, Convention Hall, Atlantic City, New Jersey.

2-6 National Hotel Exposition (44th) The Coliseum, New York City. (A.G.A. will exhibit.)

9-11 API, 39th annual meeting, Conrad Hilton Hotel, Chicago, Illinois.

9-13 National Electrical Manufacturers Association, annual meeting, Traymore Hotel, Atlantic City, New Jersey.

20 NGAA, Panhandle Plains regional, Herring Hotel, Amarillo, Texas.

29-Dec. 4 ASME annual meeting, Chalfonte Haddon Hall, Atlantic City, New Jersey.

December

7-11 NACE-University of Illinois Corrosion Short Course, Urbana Campus, Urbana, Illinois.

January 1960

20 NEGA, operating division, Sheraton Plaza, Boston, Massachusetts.

22 Oklahoma Utilities Association, accounting section, Tulsa, Oklahoma.

28 NEGA, accounting division, Statler Hilton, Boston, Massachusetts.

February 1960

1- 4 American Society of Heating Refrigerating & Air Conditioning Engineers, semi-annual meeting, Memorial Auditorium, Dallas, Texas.

1- 5 ISA instrument-automation conference, Houston, Texas.

29-Mar. 2 A.G.A. general management section conference, Pittsburgh-Hilton Hotel, Pittsburgh, Pennsylvania.

March 1960

14-18 National Association of Corrosion Engineers, annual convention, Dallas, Texas.

21-23 Mid-West Gas Association, annual meeting and convention, Hotel St. Paul, St. Paul, Minnesota.

23 Oklahoma Utilities Association, accounting section, Biltmore Hotel, Oklahoma City, Oklahoma.

24-25 Oklahoma Utilities Association, annual convention, Biltmore Hotel, Oklahoma City, Oklahoma.

24-25 NEGA annual meeting, Hotel Statler, Boston, Massachusetts.

30-April 1 GAMA annual meeting, The Greenbrier, White Sulphur Springs, West Virginia.

April 1960

5- 7 A.G.A. sales conference on industrial and commercial gas, The Shamrock Hilton, Houston, Texas.

19-21 Southwestern Gas Measurement Short Course, University of Oklahoma, North Campus, Norman, Oklahoma.

19-21 A.G.A. Research & Utilization Conference, Hotel Carter, Cleveland, Ohio.

21-22 Indiana Gas Association, French Lick-Sheraton Hotel, French Lick, Indiana.

25-27 A.G.A.-EEI National Conference of Electric and Gas Utility Accountants, Roosevelt & Commodore hotels, New York City.

25-27 Southern Gas Association, annual convention, Galveston, Texas.

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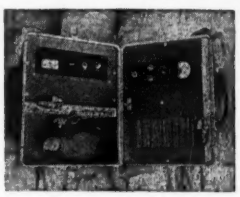

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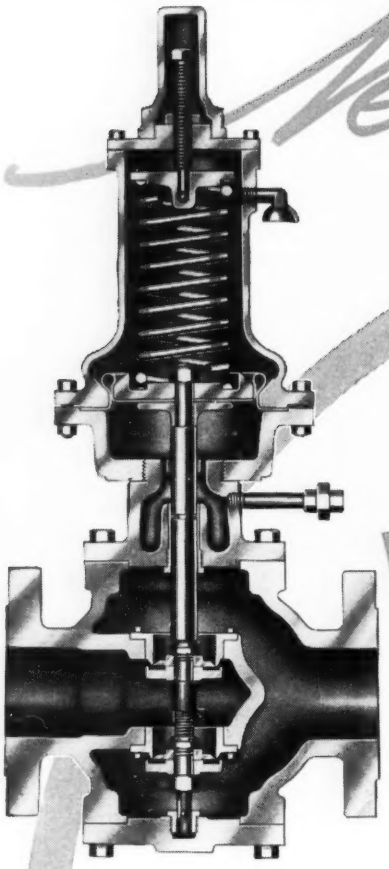
MODEL 441-57S

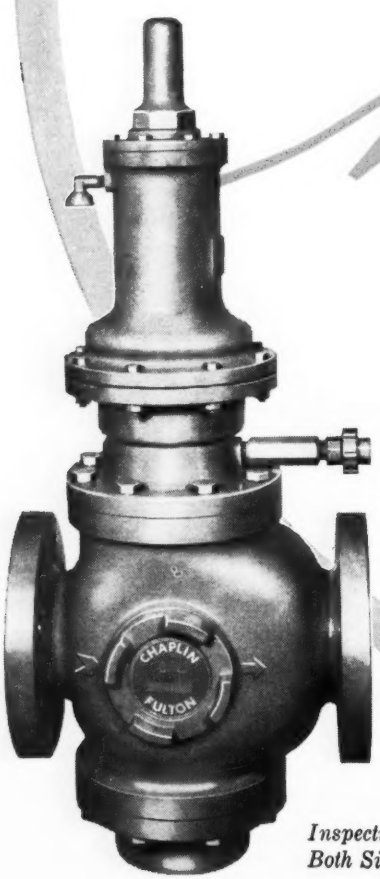
GAS REGULATOR



SIZE: 2"—3"—4"—6"
125 lb. iron—W. P. 175 psi
250 lb. ductile—W. P. 400 psi
Series 30 steel—W. P. 720 psi

Model 57-S, a simple spring loaded regulator, operates on a new diaphragm principle which will control accurately until the regulator is wide open. The outlet pressure "fall-off," typical of spring regulators, is eliminated—not by an uncontrolled velocity effect—but by a diaphragm which changes its size as the valve moves to give straight line control. For pounds-to-pounds service,—controlled pressures to 75 psi with same assembly.

New in design!



Inspection Plates Both Sides.

Also, a new body design—441—with gas exit areas greatly enlarged to prevent turbulence and increase capacity.
And to help in your visual inspection program—side inspection plates on *both* sides of the body have been included. Screwed-on with O-ring seal, they can be quickly removed and replaced—no gasket problem. Standard face-to-face dimensions now make the 441 interchangeable with other regulators.

ACCURATE CF MFG CO DEPENDABLE

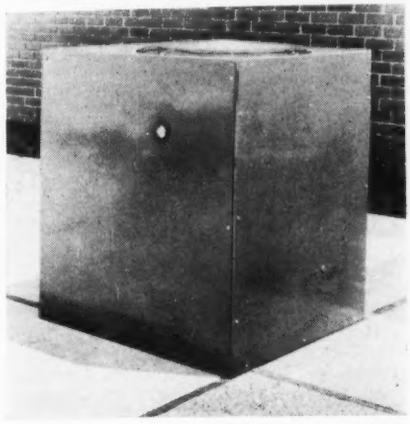
Chaplin-Fulton
MANUFACTURING COMPANY
Pittsburgh 25, Pennsylvania

59-2

PRODUCT PARADE

MATERIALS – EQUIPMENT – SERVICES

NEW GAS AIR CONDITIONER. Day & Night Manufacturing Company has entered the gas air conditioning field with a remote type air cooled gas air conditioner that requires no water tower installation or maintenance and no water consumption. Cooling unit is installed

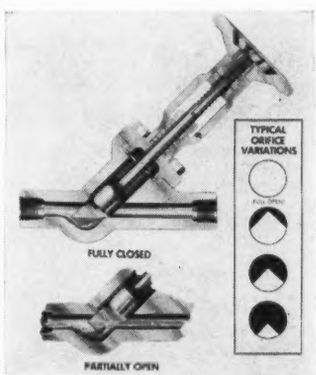


wherever it is convenient in an outside location; supplies chilled water to compact cooling coil installed inside the forced-air furnace for year 'round, one-full comfort system, or on the fan-coil blower unit where system is for cooling alone. Neither the cooling coil that installs on the furnace or the ceiling-hung fan-coil blower unit requires extra floor or closet space.

CIRCLE (1) ON THE REPLY CARD

TWO NEW APPLIANCE REGULATORS designed especially for use on outdoor gas lights are now available from Reynolds Gas Regulator Company, Inc. Construction of both the NR-⅛E for oz-to-oz regulation, and the NRB-⅛E, for lb-to-oz regulation, is similar to that of the other Reynolds house service regulators. The NRB-⅛E is believed to be the first regulator of this size to offer psi inlet pressure.

CIRCLE (2) ON THE REPLY CARD



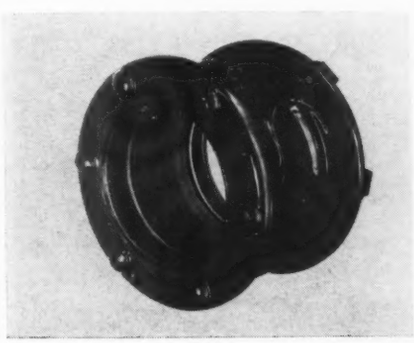
STRAIGHT-FLOW CONTROL VALVE manufactured by General American Valve Company allows all gas flow to move through the valve in a straight path at all orifice settings; there is almost zero pressure drop when valve is fully opened; it has an infinitely variable throttling control and ultra-low turbulence. K-factor of the straight flow control valve is only 0.35, 1/30th that of most globe valves. Principle advantage of valve is its ability to pass more gas for a given pressure with less turbulence. This characteristic allows a greater capacity to be obtained from an installation without changing the dimensions of the piping or increasing the pressure. Further advantage is its resistance to clogging as all flow is concentrated in a triangle-shaped orifice instead of in an annular ring.

CIRCLE (3) ON THE REPLY CARD

IMPERIAL, A NEW MODEL GAS LIGHT, seventh in the expanding line of "Gaslites by Arkla," is now being marketed by Arkla Air Conditioning Corporation. New model features a golden eagle crest, a sharply tapering glass area, hurricane-style chimney, and a decorative glass gallery. It is available with 8-ft, 3-in. diameter post; measures 14⅜-in. high, 13¼-in. wide, and provides 75 to 80 candlepower. Conforms to manufacturer's rigid standards of quality and durability; is shipped as a "package" complete with post and enclosed copper tubing.

CIRCLE (4) ON THE REPLY CARD

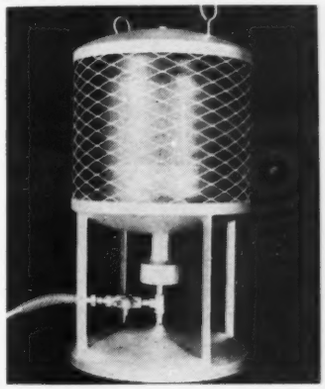
Additional copies of the special "Diary of an Industry" October issue of AMERICAN GAS JOURNAL are available for $1 each.



NEW COUPLING FOR JOINING MILL-WRAPPED PIPE has been introduced by Dresser Manufacturing Division, one of the Dresser Industries. The "Stab-Clad" Coupling, Style 123, factory-coated with a permanent coating of coal tar epoxies and coal tar enamels equal to the best mill wrap specifications is of the stab-type, electrically bonded, and pre-assembled. On the job, it is necessary only to stab the pipe end into the coupling and tighten the bolts. Simplified installation procedure is made possible by a specially designed gasket that permits easy stabbing, yet assumes wedge shape of standard style 38 gasket upon compression. An ARMORED ® gasket and integral bond wire provide complete electrical continuity. Couplings are furnished in sizes 2 thru 12-in. ID and are individually packaged.

CIRCLE (5) ON THE REPLY CARD

PORTABLE RADIANT GAS HEATER developed by Bright Leaf Industries of Charlotte, North Carolina, is specially designed to produce large amounts of radiant heat for industrial and commercial areas. Unit has high capacity burner that operates on all gases; the intensely hot products of combustion are forced



out through tiny holes in the stainless steel heat exchanger, causing entire surface of heat exchanger to glow red hot. The cylindrical heat exchanger beams radiant energy off this red hot surface outwardly until it strikes a solid object. Portable heater is solidly constructed, has high capacity burner made of heavy cast iron for maximum life, and a wire safety guard around the heater to prevent contact with the red hot perforated screen of the heat exchanger. Has 100 percent safety shut-off valve. The 100,000 Btu Space-Ray heater is 36-in. high, 18-in. in diameter, and weighs 50 lb. Also available in 50,000 Btu size unit.

CIRCLE (6) ON THE REPLY CARD

LOW PRESSURE REGULATOR manufactured by Fisher Governor Company has several design changes, including a novel valve and cage assembly that permits removal and replacement of the resilient disc double port inner valve and adjustment for tight shut-off, without removing the body from the line or disconnecting stem. New series is available in 1½ and 2-in. sizes; provides precision in control of low pressure gas in large industrial and commercial installations.

CIRCLE (7) ON THE REPLY CARD

ELECTRONIC COUNTER speeds integrating of circular flow charts — Flow Measurement Company, Inc., of Tulsa has introduced an electronic counter that eliminates human errors due to transposition of numbers and incorrect subtraction while integrating circular flow charts. The counter easily adapts to current integrators; permits counting and totalizing of electrical impulses at a rate of from less than one a second to about 3500 per second. An electro-mechanical sequencing system permits the total count of the impulses as shown on the tubes to be registered on the mechanical printer. Unit weighs 25 lb; has a cast aluminum case 10-in. high, 11-in. wide, and 17-in. deep.

CIRCLE (8) ON THE REPLY CARD

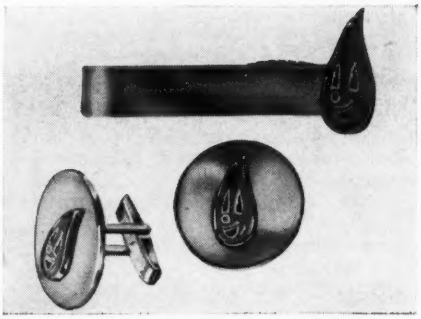
PRODUCT PARADE

NEW TYPE SERVICE CONNECTION, called the Thermotap, utilizes high temperature of reaction of powdered copper oxide and aluminum to produce a fusion weld that is permanent and cannot be loosened by vibration. Available from Continental Industries, Inc., the thermite weld connection can be completed in a matter of minutes, and is ideal for field installations as no external source of power is required. Available in tap sizes ¼- through 1-in.; ideal for gaslight installations.

CIRCLE (9) ON THE REPLY CARD

EXTRA-LONG LIFT ARMS to provide greater clearance for dumping into high sided trucks, railroad cars, or tall hoppers are now available as optional equipment on J. I. Case W-9 and W-10 Terraload'rs. New arms, 2 ft longer than standard, give both loaders clear dump height of 11 ft 6 in. with bucket retracted, and 10 ft 2-in. with bucket fully dumped. Forward reach at 7 ft lift height is 89 inches. Carrying capacities at 4 mph are 3750 for the W-9 and 4500 lb for the W-10, compared with 6000 and 6500 lb for standard models.

CIRCLE (10) ON THE REPLY CARD



NEW FLAME-SHAPED JEWELRY — Cuff-link and tie-bar set — is now available from Handy Flame. Ideal as gifts for employees, customers, and friends of the gas industry. Image is hard-fired vitreous enamel in two shades of blue on a rhodium plated base. Other matched items—including lapel pins, key chain, and earrings—are available.

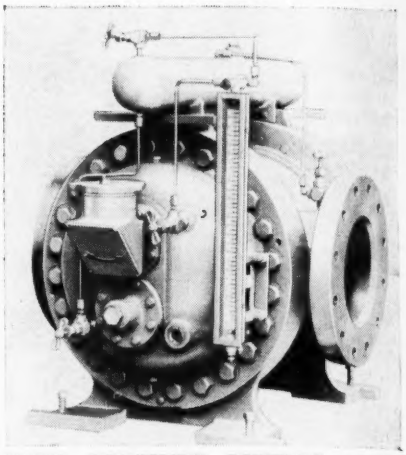
CIRCLE (11) ON THE REPLY CARD

DITCH WITCH TRENCHER is now available in a 12-hp model that cuts trenches to 5-ft depths and 12-in. widths. Scaled up from the M-3 model, new trencher handles wider and deeper trenches and tougher digging conditions; can be used for foundation footings, water lines to 5 ft cover, gas services and main extensions, etc. Is powered by Wisconsin AGN 12-hp, air-cooled engine.

CIRCLE (12) ON THE REPLY CARD

NEW ALUMINUM METER now available from American Meter Company is lightest, most compact aluminum case meter available for its capacity. Weighs only 46 lb, has a rated capacity of 800 cfh at ½-in. w. c. differential — 20 psi working pressure. Unit operates at only 2.6 revolutions per cu ft of gas, uses porous bronze bushings on stainless steel pins at critical bearing points, and has a solid, forged stainless steel crank to provide longer meter life and greater accuracy through minimum wear and friction.

CIRCLE (13) ON THE REPLY CARD



HIGH PRESSURE METERS. Roots-Connersville Blower Division of Dresser Industries, Inc., has announced a new line of high pressure gas meters with capacities from 84,000 to 1,600,000 scfh and pressures to 600 psi. The four sizes provide sustained accuracy of ±1 percent throughout a flow range from 10 to 100 percent of rated capacity. Accuracy of the R-C rotary positive displacement meter is unaffected by pulsation or line surge. Other advantages include minimum maintenance and servicing, ease of installation, and space savings.

CIRCLE (14) ON THE REPLY CARD

Give Your Home a Gaslite for Christmas

Gaslites BY ARKLA

Brighten your holiday season and the whole year through with distinctive Gaslites by Arkla for your home. A superb line of traditional and contemporary gas lighting fixtures, Gaslites by Arkla are designed to lend graciousness to any outdoor setting . . . a mark of the owner's taste for beauty.

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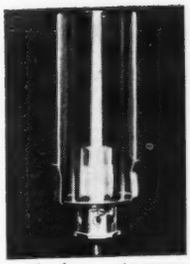
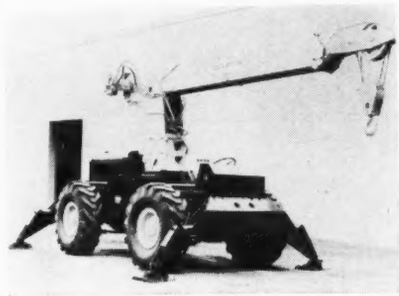


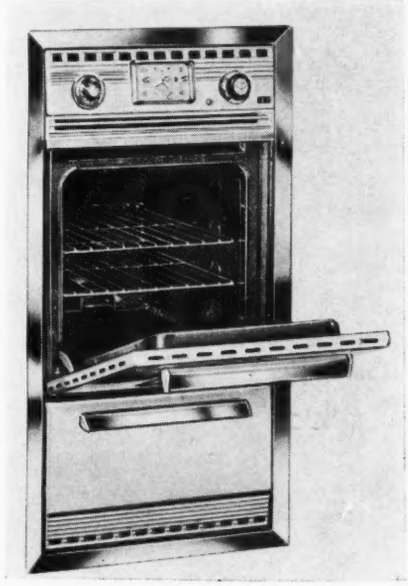
NEW CHIMNEY SET FOR GAS LIGHTS. Cambria Chimney Set, manufactured by Maxitrol Company, features simple, clean lines to bring out the rich glow of the gas flame. Consists of a heat-resistant, fire polished clear glass cylinder, stamped aluminum holder bracket, and lock washer for attachment to Maxitrol gaslight burner.

CIRCLE (15) ON THE REPLY CARD



POWERFUL SELF-PROPELLED HYDRAULIC CRANE, manufactured by Austin-Western, member of the Baldwin-Lima-Hamilton Corporation, is similar to their standard model 210 but has twice the capacity. Handles 10-ton lifting as smoothly, flexibly and with the easy maneuverability previously available only in the 5-to-6 ton range. Telescoping hydraulically-operated boom extends horizontally to 25 ft, retracts to 15; swings through full circles without limit stops and tilts upward to 60 deg from horizontal. Manual boom extensions, cabs, and other accessories are available, and the hydraulically operated outriggers are optional.

CIRCLE (16) ON THE REPLY CARD



ATHENS STOVE WORKS has a new line of Vesta Gas Built-Ins. Giant 24-in. oven, shallow cook-top, and simplified installation are features of the new group. Ovens have a non-fogging "Perma-View" window, automatic cook-timer, convenient appliance outlet, exterior oven light switch, bright-plated non-tilt oven racks, and eye-level "minute-minder."

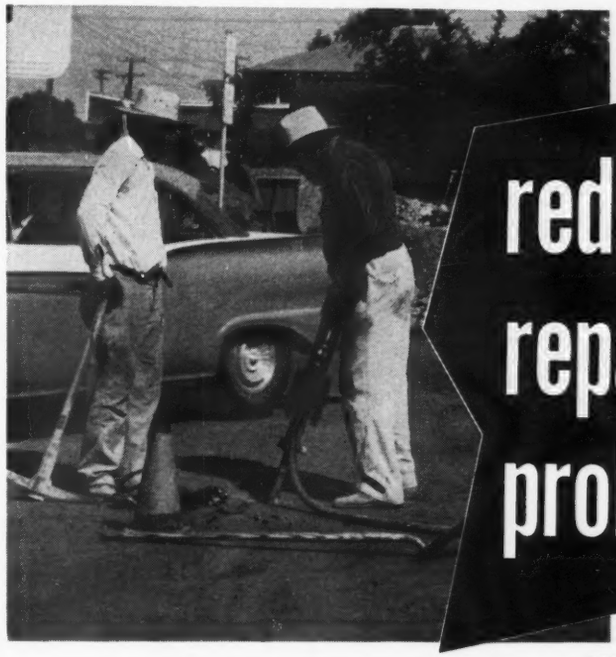
CIRCLE (17) ON THE REPLY CARD

AIR-GAS PROPORTIONING VALVES for either manual or automatic operation are now available in 5 sizes from Eclipse Fuel Engineering Company. Valves are designed to provide economical 2-in-1 valve method of controlling air and gas to provide proper blending required of any firing condition. Either electric or air-operated automatic controls may be used; mounting bases and the required connecting linkages can be provided to accommodate wide variety of industrial control motors or air diaphragms. Valves can be used to handle manufactured gas, natural gas, propane, and butane; can be used to supply multiple burner installations permitting maximum design economy.

CIRCLE (18) ON THE REPLY CARD

DAVIS FIRST AID KIT now has a "C-Thru" window in the cover to make possible more effective and rapid inventory surveillance of first aid supplies. Kits are designed for hanging on the wall and can be quickly removed for carrying to required areas.

CIRCLE (19) ON THE REPLY CARD



reduce repair problems

STANDARD MAGNESIUM ANODES CUT MAINTENANCE COSTS, ELIMINATE HAZARDS, REDUCE UNACCOUNTED-FOR GAS!

Maintenance costs are skyrocketing. Yet a simple, effective method of reducing or completely eliminating these costs is with Standard Magnesium Anodes. And they eliminate hazards and reduce unaccounted-for gas.

A cathodic protection system using Standard Magnesium Anodes is inexpensive and easy to install. It will add years of maintenance-free life to old as well as new lines by stopping corrosion.

Protect that next installation by using Standard Magnesium Anodes.

FREE: Booklet describing how you can prevent corrosion.

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NEWSREEL

NEW JERSEY GAS ASSOCIATION has elected Frank C. Pesveyc, Public Service Electric and Gas Company, their new president for 1960 at the 44th annual meeting held recently at Spring Lake, New Jersey. W. Daniel Williams, vice president of New Jersey Natural Gas Co., has been elected first vice president of the state association; Hugh Wathen, South Jersey Gas Company, second vice president, and Ralph E. Martin, administrative assistant of New Jersey Natural Gas Co., was re-elected secretary-treasurer.

CONSUMPTION OF GAS by electric utilities in the U. S. during July amounted to 182,194,222,000 cu ft, the largest monthly use of record and an increase of 18.5 percent over the 153,779,096,000 cu ft burned in July 1958, the FPC reported in its monthly publication, "Consumption of Fuel for Production of Electric Energy." The July total was 7.6 percent above the previous high of 169,371,018,000 cu ft consumed in June.

CONSTRUCTION CONTRACTS in the U. S. in August declined 11 percent below the level of the corresponding month of 1958, but the total of $3,083,649,000 was the second highest ever reported for any August, according to a report from the F. W. Dodge Corporation. The Dodge seasonally adjusted index of construction contracts for August was 258 (1947-49=100), down from 289 in July. George Cline Smith, Dodge vice president, noted the decline probably stemmed in large part from the steel strike. "Undoubtedly the steel strike had some effect," Dr. Smith said, "although it is difficult to measure exactly. There is no evidence that any great slowing of actual construction work occurred in August as the result of steel stortages, but awarding of contracts for future jobs may well have been held up because of uncertainties over steel deliveries and prices."

CONSOLIDATED NATURAL GAS COMPANY, New York, has established a new department to aid its subsidiary companies in the development of their industrial markets. The energetic program of market development will be headed by Christy Payne, Jr., formerly vice president of The Peoples Natural Gas Company, a Consolidated subsidiary operating in Western Pennsylvania. In his new position as system manager of market development, Payne will continue to make his headquarters in Pittsburgh. Consolidated's subsidiaries include The East Ohio Gas Company; Lake Shore Pipe Line Company; The Peoples Natural Gas Company; New York State Natural Gas Corporation; Hope Natural Gas Company, and The River Gas Company.

Detection, Repair and Prevention of Gas Leaks

Addendum to the above article that appeared on page 16-28 of the August, 1959, issue of AMERICAN GAS JOURNAL

Amplification of the brief discussion (page 25, August, 1959 issue) of the difficulties encountered by some companies in trial applications of the Fueling method has been found desirable to create a proper impression of the current state of development of this method.

The difficulties described were encountered in the early trial applications of the method. The problem of application consistency has since been solved through development of a sealant package that assures proper sealant blending over the range of field conditions normally encountered.

A procedure for removal of oil from a contaminated surface, through use of an oil absorbing powder, has also recently been developed for use in conjunction with this method.

— The Author and the Editors

FIFTH ANNUAL CORROSION CONTROL SHORT COURSE, sponsored by the Houston section, National Association of Corrosion Engineers, will be held January 22 and 23, 1960, at the University of Houston. Course will cover fundamentals of corrosion, cathodic protection, maintenance and operation of corrosion preventive systems, including rectifiers and galvanic anodes. Course is designed for operating field men, supervisory personnel, and sales personnel.

ELIMINATE COSTLY LUBRICATED PLUG VALVES

REPLACE THEM WITH...

the PLUGAROO NON-LUBRICATED PLUG VALVE

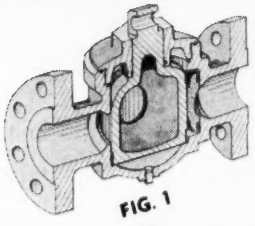

FIG. 1

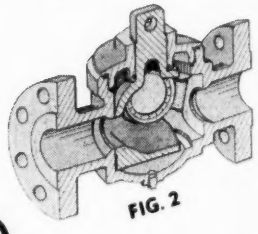

FIG. 2

The PLUGAROO combination Plug and Check Valve eliminates expensive lubricating equipment . . . reduces costly maintenance trips. Fig. 1—A quarter turn closes the plug against clapper for positive seal, yet wide tolerances prevent plug or valve-body gauling. Fig. 2—In "open" position, the 20° vertically hinged clapper seals under its own weight and the PLUGAROO operates as a Synthetic Seal Check Valve. Plug locking device is optional on your request. The PLUGAROO is available in semi-steel, steel, and aluminum-bronze thru series 90 (2160# W.P.—3250# Test). API, ASA dimensions for all standard end connections. For details, write:

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We also have a model for use with saddles, threaded at the base to screw into the saddle.

Each tee is tested to 5,000 p.s.i. hydraulic pressure, and carries "Rated 1,000 pounds". A 5 to 1 safety factor. A real high pressure tee. Made from steel similar to pipe, it welds easily, and in the saddle model, takes a perfect thread.

Both sizes made have 1" base. Side outlet can be furnished 3/4" or 1", end beveled for welding, standard pipe size, either threaded, or smooth for compression coupling. Or outlet can be internally threaded for 1/2" pipe size.

With this tee you will be forever free from the cost of drilling machines, broken drills and drill machine maintenance and repairs. We feel this tee is the finest service improvement ever offered to the gas industry. Write for circular with installation instructions.

M. B. SKINNER CO.
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SKINNER-SEAL PUNCH-IT TEE

Statement Required by the Act of August 24, 1912, as Amended by Acts of March 3, 1933, and July 2, 1946 (Title 39, United States Code, Section 233) Showing the Ownership, Management, and Circulation of

AMERICAN GAS JOURNAL

Published monthly, semi-monthly in August, at Dallas, Texas, for October 1, 1959.

1. The names and addresses of the publisher, editor, and business managers are:

Publisher: The Petroleum Engineer Publishing Company, 800 Davis Bldg., Dallas, Texas.

Editor: Dean Hale, 800 Davis Bldg., Dallas, Texas.

Business Manager: Joe B. Woods, 800 Davis Bldg., Dallas, Texas.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the name and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual member, must be given.)

The Petroleum Engineer Publishing Company, 800 Davis Bldg., Dallas, Texas.

3. The known bondholders, mortgagees and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. Paragraph 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

Joe B. Woods, Business Manager.

Sworn to and subscribed before me this 1st day of October 1959.

(Seal) Lillian H. Johnston
Notary Public, Dallas County.
(My commission expires June 1, 1961.)

Highlights of A.G.A.'s 41st Annual Convention

Industry Research Activities To Treble by 1965

Gas industry will treble its research activities by 1965, J. Theodore Wolfe, president of the American Gas Association predicted in a speech before the association's annual convention held early in October at Chicago. Wolfe estimated industry's total annual outlays for research will advance from present $1,800,000 to about $15,000,000. A.G.A. alone will boost research spending by 39 percent next year, from $1.8 to $2.5 million.

13 Companies Receive A.G.A. Safety Awards

Safety Achievement Awards were presented to 8 gas distribution companies, 4 transmission companies, and 1 LP-Gas distributor for the lowest accident frequency rates in the industry. Awards went to the following distribution companies: Baltimore Gas and Electric Co. (1.23 frequency rate); Central Illinois Light Co. of Peoria, Illinois, (0.00); Mystic Valley Gas Co., Malden, Massachusetts, (0.00); and Wisconsin Southern Gas Company, Inc., of Lake Geneva, Wisconsin (0.00); Iroquois Gas Co., Buffalo, New York, (3.27); Citizens Gas and Coke Utility, Indianapolis, Indiana, (1.51); The Hartford (Connecticut) Gas Co., (6.70); and The Superior Water, Light & Power Co., Superior, Wisconsin (0.00). Other companies receiving awards were: Gas Co. of Vermont, Inc., Barre, Vermont; Texas Eastern Transmission Corp.; Southern Natural Gas Co.; Michigan Gas Storage Co.; Natural Gas Storage Co. of Illinois.

Detroit Utility Rates Top PR Award

Michigan Consolidated Gas Co., Detroit, has received top honors in the third annual Public Relations Achievement competition of the A.G.A. for "the year's outstanding contribution to greater understanding of the gas industry and modern gas service" from among 31 entries submitted by U. S. and Canadian companies. Michigan Consolidated's winning program, designated for top award after placing first in School Activities competition was based on its unique educational exhibit, "Gasarama." The theatrical production, presented by employees of the company, dramatizes the ultra-modern convenience, versatility, and safety of gas; shows how it is produced, transported thousands of miles and delivered automatically to homes and industry.

Five other companies received first place awards in specific classifications: Consumers Power Co., Jackson, Michigan, in stockholder relations; Milwaukee Gas Light Co., community relations; Northern Illinois Gas Co., Aurora, Illinois, employee relations; Pacific Gas & Electric Co., San Francisco, customer relations; and Washington Water Power Co., Spokane, for a special project dealing with the merger of its electric operations with a gas company.

Honorable Mention certificates were awarded to Baltimore Gas and Electric Co.; Cascade Natural Gas Corp., Seattle, Washington; Iowa-Illinois Gas & Electric Co., Davenport, Iowa; Minnesota Valley Natural Gas Co., Minneapolis, and Mystic Valley Natural Gas Co., Malden, Mass.

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21 Gas Engineers Receive Merit Awards

A.G.A's Operating Section Awards of Merit were presented to 21 gas engineers for "having faithfully and constructively served the American gas industry and made continuous and extensive contribution to further the interests and promote the welfare of the industry." Receiving the awards were: **Amos H. Abbott,** retired gas engineer formerly with Northern States Power Company, Minneapolis; **J. G. Barnhart,** superintendent, compressor station department, Natural Gas Pipeline Co. of America, Chicago; **J. R. Beckwith,** radio engineer, Washington Gas Light Co.; **Rex V. Campbell,** general superintendent, American Louisiana Pipe Line Co., Detroit; and **N. P. Chesnutt,** chief engineer, Southern Union Gas Co., Dallas. Also **B. J. Clarke,** vice president in charge of engineering and research, The Columbia Gas System Service Corp., New York City; **W. F. Crutchley,** chief dispatcher, Consolidated Gas System, Consolidated Natural Gas Co., Pittsburgh; **M. S. David,** manager of engineering and development, Boston Gas Co., Jamaica Plain, Massachusetts; **D. L. Drake,** assistant superintendent, distribution, Baltimore Gas and Electric Co.; and **T. J. Dwyer,** general superintendent, gas operations, Baltimore Gas & Electric Co.

Others receiving Awards of Merit were **L. L. Elder,** supervisory engineer, The Columbia Gas System Service Corp., **Prof. Samuel H. Graf,** consultant, Corvallis, Oregon; **W. B. Haas,** vice president in charge of Northern Region, Northern Natural Gas Co., Omaha; **B. E. Hunt,** gas distribution design engineer, Illinois Power Co., Decatur, Ill.; and **L. R. Kirk,** chief geologist, The Ohio Fuel Gas Co.

Also **P. W. Kraemer,** vice president for operations, Minneapolis Gas Co.; **H. T. Maloney,** assistant to the assistant director, production department, Philadelphia Gas Works Division, The United Gas Improvement Co.; **H. B. McNichols,** gas measurement engineer, The Columbia Gas System Service Corp.; **Calvin Scott,** chief dispatcher, Oklahoma Natural Gas Co., Tulsa; **D. W. True,** assistant vice president for operations, Milwaukee Gas Light Co.; and **C. L. Woody,** supervising engineer, United Gas Corp., Houston.

Kirk Receives Operating Section Award of Merit

Lysle R. Kirk, chief geologist for Ohio Fuel Gas Co., Columbus, has been awarded the A.G.A. Operating Section Award of Merit for his outstanding service as a member of the A.G.A. committee on Underground Storage and as current chairman of the Underground Gas Storage Statistics Subcommittee. Kirk helped organize the A.G.A. Committee on Underground Storage in 1951 and has served continuously on it since then.

Accounting Merit Awards Go to 6

Six Order of Accounting Merit Awards have been presented to **George F. Dixon,** property records supervisor, Milwaukee Gas Light Co.; **Henry R. Flanegan,** manager of customer service department, Philadelphia Electric Co.; **Edgar R. Mellon,** assistant to the senior vice president, Washington Gas Light Co.; **Charles J. Nichols,** auditor, Baltimore Gas and Electric Co.; **Claude F. Wahli,** customers accountant, Knoxville (Tennessee) Utilities Board; and **Emmet T. White,** assistant to the manager of customer billing, Public Service Electric and Gas Co., Newark, New Jersey.

Trunk Honored with Distribution Award

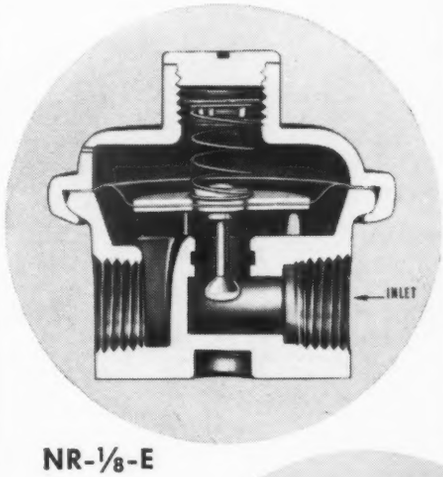
Edwin F. Trunk, chief engineer of Laclede Gas Co., St. Louis, has received the Distribution Achievement Award of the A.G.A.'s Operating Section, which is awarded annually to an individual who has made an outstanding contribution to the science and art of gas distribution during the current year. The award, donated by American Meter Co., Philadelphia, includes a $1000 cash prize, a certificate and round-trip transportation to the A.G.A. convention. Trunk applied the Hardy Cross method of distribution network analysis and the McIlroy analog computer to distribution design work. He was also responsible for the design of Laclede's underground storage project.

Dunn Receives Industrial-Commercial Award

Thomas Z. Dunn, commercial sales manager for The Ohio Fuel Gas Co., Columbus, Ohio, has been presented with the Industrial-Commercial Achievement Award. Dunn, winner of the 1958 PEP Award, was formerly chairman of the section's Water Heating and Steam Generation Committee and chairman of the Task Force Committee that prepared the reference section of the A.G.A. pamphlet, "Water Heating for Commercial Kitchens." Active on the section's Education, Food Service, Promotion Advisory and Managing Committees, he will serve in 1960 as chairman of the Food Service Committee.

Gaslite

SERVICE REGULATORS



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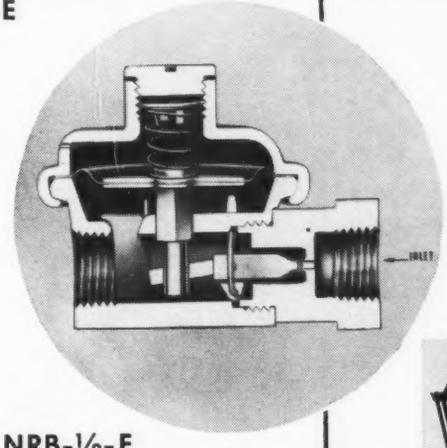
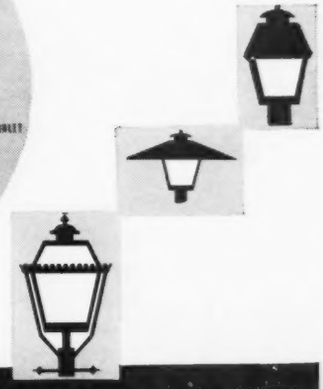


NRB-⅛-E



REYNOLDS GAS REGULATOR COMPANY, Inc.

ANDERSON, INDIANA, U.S.A.

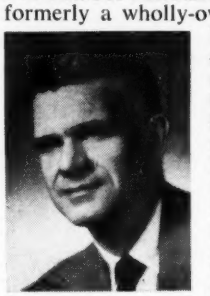
A Subsidiary of Arkansas Louisiana Gas Company

NEW 7½ TON GAS AIR CONDITIONER installed in Public Service Electric and Gas Company's central gas plant in New Jersey is the first such unit installed in the East. System is capable of operating at least five cooling seasons without major servicing the American Gas Association, sponsor of research contributing to the system's development, reports. Unit is powered by a four-cylinder, four-cycle gas engine designed and built by Continental Motors Corporation of Muskegon, Michigan, in cooperation with A.G.A.'s PAR Program. Air conditioning unit is designed to run at least 10,000 hours before overhaul, with only one service call required per cooling season; is manufactured by Comfortemp Division of Comfort Products, Inc., Dallas.

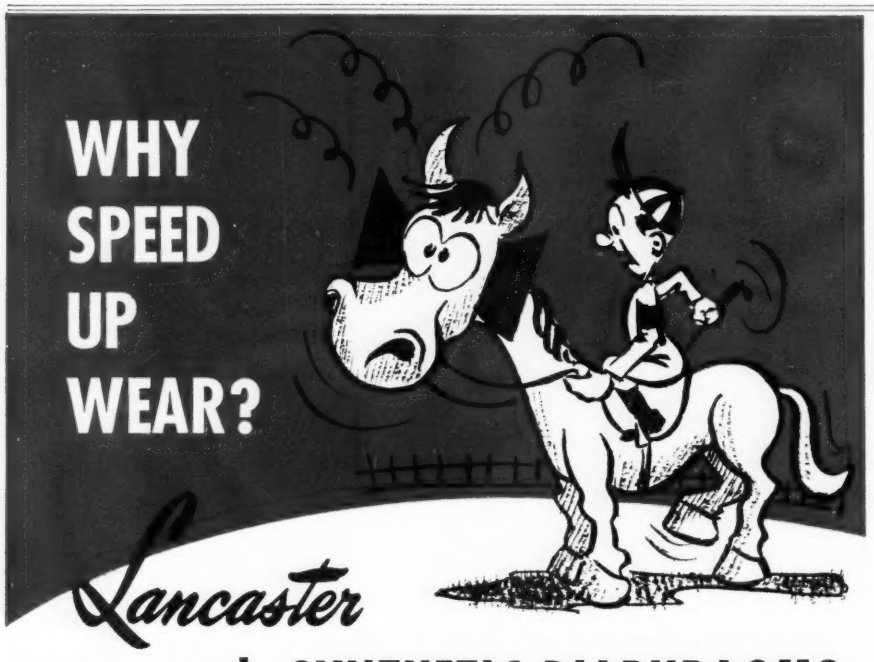
THE PACIFIC COAST GAS ASSOCIATION has elected its 1959-60 slate of officers headed by **Walter T. Lucking,** president, Arizona Public Service Co. Lucking took over the president's gavel from **R. R. Blackburn,** senior vice president, Southern California Gas Co., and outgoing PCGA president. Other newly-elected officers of the association are: **H. G. Dillin,** executive vice president, San Diego Gas & Electric Co. for first vice president; **W. J. Bailey, Jr.,** president, Day & Night Manufacturing Division, Carrier Corporation, for second vice president; and **L. W. Coughlan,** comptroller, Pacific Gas & Electric Co. for treasurer.

Chosen as general chairmen of the four sections of the PCGA were: **James F. Gary,** vice president-operations, Washington Natural Gas Co., general chairman, operating section; **H. M. O'Haver,** central division sales manager, Southern California Gas Co., general chairman, sales-advertising section; **C. W. DeVoe,** comptroller, San Diego Gas & Electric Co., general chairman, administrative services section; and **S. F. Skafte,** director of engineering, Utility Appliance Corp., general chairman, manufacturers' section. Elected as vice chairmen of the respective sections were: **Robert I. Snyder,** vice president, Southern California Gas Co., vice chairman, operating section; **D. W. Hosford,** general sales manager, Northwest Natural Gas Co., vice chairman, sales-advertising section; **W. E. Johns,** attorney, Pacific Gas & Electric Co., vice chairman, administrative services section; and **C. R. Lombardo,** Hoyt Heater Co., vice chairman, manufacturers' section. New directors of the PCGA elected for 2-year terms were: **A. R. Bailey,** executive vice president, Southern Counties Gas Co. (re-elected for a second term); **W. A. Cook,** vice president, Northwest Natural Gas Co.; **A. B. Robertson,** vice president and general counsel, British Columbia Electric Co. Ltd.; and **R. W. Todd,** vice president and executive engineer, Pacific Lighting Gas Supply Co.

SUPERIOR METER COMPANY, INC., formerly a wholly-owned subsidiary, has been merged into the corporate structure of Neptune Meter Company. Walter H. Sieger, former president of Superior, has been appointed a vice president of Neptune and will act as general manager of the new division. The organization, to be known as Superior Meter Division of Neptune Meter Company, will continue to manufacture and sell gas meters, and gas meter parts and accessories under the "Superior" trade name.



PREMONITION OF THE EARLY ARRIVAL OF COOLER WEATHER coupled with the continued high rate of home construction in the U. S. are reflected in the 24.1 percent increase in number of gas heating equipment units shipped to market in August, the Gas Appliance Manufacturers Association reports. Forced warm air and gravity type furnaces were up 27.3 percent over last year; gas fired boilers, up 12.9 percent; gas conversion burners, used in adapting existing heating equipment from other fuels, 18 percent ahead of August, 1958, sales. Vented recessed wall heaters were up 20.7 percent; direct heating equipment, including vented and unvented room heaters, up 5.5 percent; and unit heaters and duct furnaces, used mainly in commercial and industrial establishments, were up 48 percent from last year. Only minus figure in the report was for gas-fired floor furnaces. August shipments totaled 9,900 units, a 5.7 percent decline from 10,500 floor furnaces dispatched in August of last year. However, the 8-month total remained on the plus side of the ledger with a 9.4 percent increase. Gas dryers were up 22 percent; gas water heater sales up 16.6 percent. Free-standing ranges were up 2.3 percent over last year; built-ins continued racking up spectacular increases over last year's sales with a 57.1 percent increase for August. Combined sales of free-standing and built-ins showed a 9.4 percent increase for the month over last year.



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improve gas meter accuracies
without any changes in index gear ratio
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High flexibility, low differentials and superior performance proved in both service and laboratories are built right into Lancaster diaphragms S-7-L (and S-700-L with carrier wire and gaskets attached) for Sprague 1-A Gas Meters.

There's no cloth lining, no fabric failure . . . gas meters can keep operating at the speed they were designed for! No need to hurry up meter wear.

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Increase meter accuracy . . . without increasing meter wear —Order Lancaster Synthetic Diaphragms!

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Manufacturers of Quality Parts for Gas Meters

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THIS INDEX IS PROVIDED AS AN ADDITIONAL SERVICE FOR OUR READERS — THE PUBLISHER ASSUMES NO RESPONSIBILITY FOR ERRORS OR OMISSIONS

A REDUCTION OF APPROXIMATELY 11 PERCENT in natural gas rates to wholesale customers has been proposed by Colorado Interstate Gas Company in an entirely new gas tariff and revised rate schedule filed late in September with the FPC. Interstate's voluntary rate reduction, which is believed to set a precedent in the gas industry, will slice approximately $4,500,000 annually off bills of natural gas consumers beginning November 1, if placed into effect by the FPC on the date requested by CIG, and assuming that the reduction is passed along to consumers by Interstate's wholesale customers. Under the new proposed rate schedules, rates charged Public Service Company of Colorado, which serves the Denver metropolitan area, will be slashed an estimated $2,300,000 annually. Second largest reduction goes to Colorado-Wyoming Gas Company, a subsidiary of Public Service Company of Colorado, whose rates will be cut approximately $950,000 annually. Other wholesale customers affected are: City of Colorado Springs, Pueblo Gas and Fuel Co., Citizens Utilities Co., Plateau Natural Gas Co., Greeley Gas Co., City of Trinidad, Kansas-Colorado Utilities, Inc., and Eastern Colorado Utility Co. In addition to offering a rate reduction, CIG said it plans to ask the FPC for permission to make a refund appropriately reflecting the reduced rates back to February 4, 1958—estimated to total about $6,700,000.

THREE KENTUCKY CITIES of Kevil, Arlington, and Barlow, won't get natural gas supplies from Trunkline if the decision of FPC examiner Richard N. Ivins stands. Examiner's decision directs Trunkline Gas Company of Houston, Texas, to supply 225,000 cu ft as part of the additional 800,000 cu ft of natural gas supply sought by United Cities Gas Company of Chicago, Illinois, to increase deliveries to Metropolis, Illinois, but denies requests by the three cities of Kevil for 314,000 cu ft; Arlington, 423,800 cu ft; and Barlow for 513,800 cu ft. Trunkline, the examiner concluded, does not have enough unallocated capacity to meet needs of these three cities or to supply the full amount sought by United Cities Gas Company.

SUBURBAN APPLIANCE COMPANY has been elected to membership in the gas clothes dryer division of the Gas Appliance Manufacturers Association. A. H. Cote, president of the company, and Roger G. Stillman, sales manager, have been named delegate and alternate from the firm to GAMA. The National Steel Construction Company and Thermo-Pak Boilers, Inc. have been elected to membership in the gas boiler division. Frank N. Killien, vice president of National Steel, and Dirk Eisinga, Jr., also a vice president, are the delegate and alternate. The delegate from Thermo-Pak Boilers is G. N. Laushkin, president, and the alternate is Nikolai Laushkin, plant engineer.

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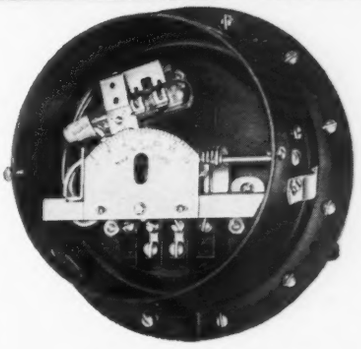
UTILITY RATE ENGINEER — Nationally-known management consulting organization needs man with operating utility rate experience, preferably with engineering degree, for work with clients. Extensive travel. Salary commensurate with training and experience. Send resume and salary requirement in first letter. Our employees have been advised. *Replies confidential.* Box number 214, **The American Gas Journal**, P. O. Box 1589, Dallas, Texas

new instrument



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For Air or Gases

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FIXED DIFFERENTIAL (Sensitivity)
When operating point is set at

Low	Med.	High
0.6″	0.8″	1.0″

MAXIMUM PRESSURE 20 psig

Equipped with Fairprene diaphragm, external adjustments, hermetically sealed mercury switch—case made of heavy gauge steel (NEMA 1)

Available fully automatic or semi-automatic with manual reset.

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HIGH TEMPERATURE LIMIT CONTROL

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Operating Range (adjustable) 50-650° F. Minimum Differential 20° F. Electrical Rating 10A. 115V. 5A. 230V.

Has independent adjustments for setting both high and low operating points; visible calibrated dial; sealed mercury contact, reversible mounting flange. Case made of heavy gauge steel (NEMA 1)

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BULLETIN BOARD

CATALOGS—BROCHURES—TECHNICAL DATA

STANDARD IRON BODY GATE VALVES are described in new 2-color, 5-page circular from Walworth Company. Circular, which supercedes a previous bulletin that has been outdated by Walworth's expanded and modernized product line, lists service ratings, size and dimensions, and material specifications. Section on higher strength cast iron wedge gate valves is also included.

CIRCLE (61) ON THE REPLY CARD

ROTARY PORTABLE COMPRESSORS, an 8-page pamphlet published by the Gardner-Denver Company, gives specifications for small 85 cfm air-oil cooled models as well as five larger — up to 900 cfm — water-oil cooled compressors. Typical heavy-duty applications are pictured and engineering principles responsible for all weather operation and the elimination of "dry starts" during cold weather are fully described.

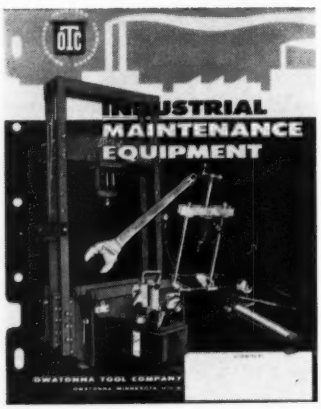
CIRCLE (62) ON THE REPLY CARD

ORIFICE PLATE SEALING UNITS are described in a one-page specifications bulletin from Daniel Orifice Fitting Co. Three types of Daniel-designed units are illustrated: The "dual seal," a synthetic rubber unit for pressures up to 600 lb ASA and temperatures from —40 to +275 F; a new plastic "Teflon" seal for pressures up to 2500 lb ASA and temperatures from —65 to +500 F; and the metallic seal, available in all sizes and for high temperature applications.

CIRCLE (63) ON THE REPLY CARD

NEW WAYS TO IMPROVE gas utility public relations and advertising are shown in new bulletin from Handy Flame. Included are details on eight ways that various companies use the copyrighted Handy Flame figure to increase effectiveness of advertising, sales promotions, and public relations — through use on letterheads, employee data cards, annual reports, envelope stuffers, and for service pins.

CIRCLE (64) ON THE REPLY CARD



INDUSTRIAL MAINTENANCE EQUIPMENT CATALOG for Owatonna Tool Company contains complete description of OTC pulling systems, "how to" photographs showing grip-o-matic and push-pullers, power twin center hole rams, pumps, and hydraulic shop presses. The 24-page, 2-color book shows how these units remove and install gears, bearings, pulleys, shafts, and couplings simply and quickly. Illustrations and descriptions of many heavy duty industrial wrenches are also included.

CIRCLE (65) ON THE REPLY CARD

GUIDE TO ELECTRONIC INSTRUMENTATION. New bulletin on electronic control for process and power industries entitled, "A Functional Guide to AutroniC Control Equipment," has been published by Swartwout Company of Cleveland. Bulletin features a large illustrated chart on which all major system components are arranged functionally to enable reader to see what control instrumentation is available for a given process variable. Chart also defines overall scope of application of AutroniC System. Bulletin contains descriptions of all components employed in AutroniC Control; introductory section explains basic principles of operation.

CIRCLE (66) ON THE REPLY CARD

BOOKSHELF

Installation of Gas Appliances and Gas Piping, NFPA No. 54, *published by the National Fire Protection Association, 60 Batterymarch Street, Boston 10, Massachusetts. Pages, 110. Price, 50 cents.*

Text of the NFPA No. 54 standard has been completely revised, expanded and illustrated to reflect the most recent requirements for installation of domestic and commercial gas burning equipment. It covers such subjects as venting, clearances, air for combustion, and ventilation. Undiluted LP-Gas appliances and piping are included for the first time. The 1959 edition now covers installation of appliances and piping at pressures of one-half lb or less for all types of fuel gases. Piping requirements are no longer limited to within buildings as previously. Standard was developed in cooperation with American Gas Association and the Liquefied Petroleum Gas Association by the NFPA Sectional Committees on Liquefied Petroleum Gas and on Utility Gas chairmanned respectively by Harold L. DeCamp of the Conference of Special Risk Underwriters and John H. Eisemann. Text is the same as ASA Z 21.30, submitted by A.G.A. to and approved by the American Standards Association.

LP-Gas Service Training Course, Book II, *published by the Liquefied Petroleum Gas Association, 11 South LaSalle Street, Chicago 3, Illinois. Set CR-2, information manual and test book $2.75; Set AH-2, information manual, test book, assignment book, $4.75; and Set IG-2, information manual and instructor's guide, $4.25.*

Second book in LPGA four-volume training course covers transportation, bulk plant operation, and distribution topics in 20 fully illustrated chapters. New volume, like Book I, is issued in four sections: an instruction manual, instructor's guide, test book, and assignment book. Subject matter is cross-referenced from book to book. Books are written by University of Texas extension division working under a grant from LPGA. The four-part series, when completed early in 1960, will offer complete course in LP-Gas equipment and appliance service and installation. Book I, issued in 1958, covers basic aspects of LP-Gas service.

Gas Facts, Gas Data Book, *and* **Historical Statistics of the Gas Industry,** *1959 editions, published by the American Gas Association, 420 Lexington Avenue, New York 17, New York. Pages, 239, —, 313 plus annual supplements. Price, $3 for Gas Facts, 50 cents for Gas Data Book, and $5 for Historical Statistics.*

The 1959 edition of **Gas Facts** presents comprehensive information on all phases of gas industry operations during 1958 and earlier years including tabular material on energy reserves, natural gas production, exploratory and developmental drilling, transmission and distribution, underground storage facilities, customers sales and revenues, appliance shipments, construction expenditures, employees and payroll, cost of gas, and other competitive forms of energy. The **Gas Data Book** is a pocket-sized summary of important highlights presented in Gas Facts, regarding the operations of the industry. The third book, **Historical Statistics of the Gas Industry** (supplied with annual supplements) contains all pertinent statistical information ever presented by A.G.A. in any of its annular statisical yearbooks.

Current Projects of the American Standards Association, *published by the American Standards Association, 70 East 45th Street, New York 17, New York. Pages, 52. Price, $1.50 non-members, 75 cents for members.*

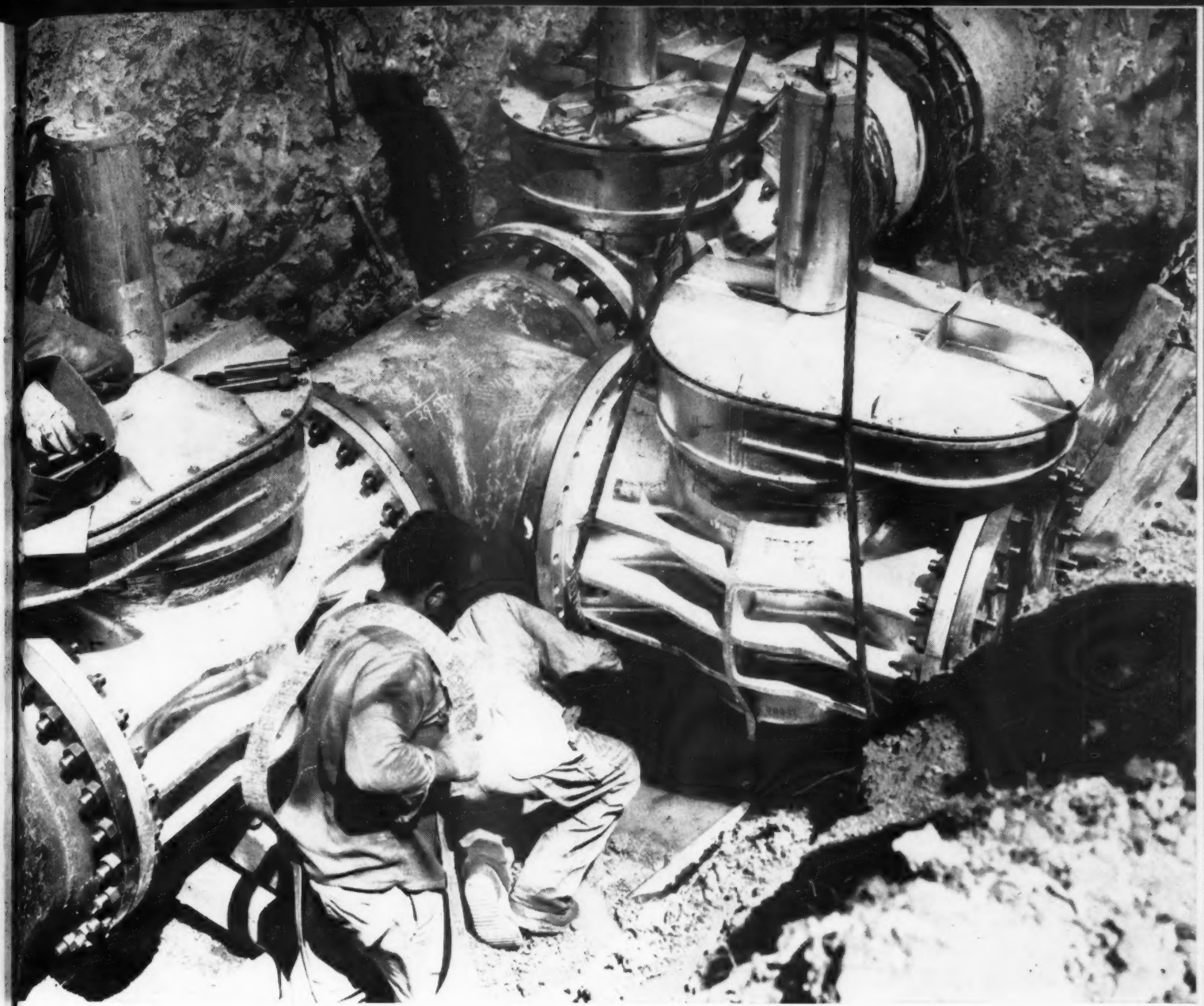
More than 425 projects are described under American Standards Association's 19 categories. Scope of each is outlined, and its sponsors listed. A cross index is also provided. A short preface describes the benefits of standards, how standardization is carried out under ASA procedures, and the main types of standards developed under each project such as definitions, standards of size, weight, volume, and rating, standards of quality, and methods of testing, analysis, and rating.

Study of the Effect of Heating Rate by Gas on Metal Flow Characteristics or Plasticity and Die Wear, Part II, *published by American Gas Association, 420 Lexington Avenue, New York 17, New York. Pages, 19, Price, $1.*

Second and final publication pertaining to studies conducted under PAR industrial and commercial gas research Project IK-7 confirms findings reported in Part I that high speed gas heating provides improved metal flow or plasticity. These characteristics may allow lower processing temperatures or reduced press loads, important advantages to the industrial gas user. Three steels, 1045 carbon, 4140 low alloy steel, and 303 stainless steel, were tested and all three showed an increase in percent reduction in height by fast heating over that resulting by slow heating with one hour soak, over the full temperature range.

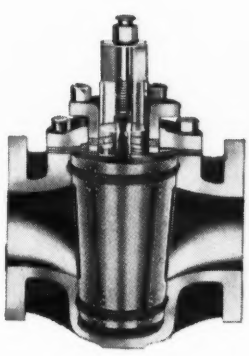
Standard for Installation and Use of Combustion Engines and Gas Turbines, NFPA No. 37, *published by the National Fire Protection Association, 60 Batterymarch Street, Boston 10, Massachusetts. Pages, 16. Price, 50 cents.*

New standard for the installation and use of combustion engines and gas turbines was developed by NFPA Committee on Internal Combustion Engines, headed by Elmer O. Mattocks of the American Petroleum Institute, New York, and adopted at the NFPA 1959 annual meeting. It replaces former standards that NFPA began developing as early as 1905. New standard covers both internal and external combustion engines using gasoline and other fuels, and gas turbines.



WHY IT PAYS TO START WITH

LUBRICATED PLUG VALVES



Lubrication: The Built-In Plus Valve

Cutaway Rockwell-Nordstrom valve shows pressurized lubricant *Sealdport* system that prevents leakage, assures dependable operation.

For every gas industry operation from well-head to homes, Rockwell-Nordstrom valves are specified more than any other valve because their pressurized lubricant sealing assures positive shut-off . . . a gas industry "must." And gas men have learned to rely on the fact that lubricant is their assurance of fast, smooth operation every time. Another equally important benefit: lubrication stops metal-to-metal wear for *longer valve life at lower cost.*

Rockwell-Nordstrom is the original and world's most complete line of lubricated plug valves and plug valve accessories. For details, write: Rockwell Manufacturing Company, Pittsburgh 8, Pa. Canadian Valve Licensee: Peacock Brothers Limited.

ROCKWELL-Nordstrom VALVES

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Appearance

No. 240

BE SURE TO SPECIFY Sprague

Please your customers with a gas meter that measures up in *looks* as well as in performance. The well-proportioned case, clean-line design, and solid construction of all Sprague Meters looks good anywhere, inside the house or outside. And it's especially important now, with outdoor installations becoming more and more popular, that your meters compliment you and the houses they serve.

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